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(71) Applicant: **Shanghai Bixiufu Enterprise Management Co., Ltd.**  
**Shanghai 201112 (CN)**

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(72) Inventors:  
• **TANG, Wanfu**  
**Shanghai 201112 (CN)**  
• **WANG, Daxiang**  
**Shanghai 201112 (CN)**  
• **DUAN, Zhijun**  
**Shanghai 201112 (CN)**  
• **XI, Yong**  
**Shanghai 201112 (CN)**

(74) Representative: **Romano, Giuseppe et al**  
**Società Italiana Brevetti S.p.A**  
**Piazza di Pietra, 39**  
**00186 Roma (IT)**

(54) **LOW SPECIFIC RESISTANCE SUBSTANCE TREATMENT METHOD AND TREATMENT DEVICE**

(57) A low specific resistance substance treatment method and treatment device. The treatment method comprises the following steps: using a conductive electrode (301) to conduct electrons to a low specific resistance substance to enable the low specific resistance substance to be charged; and using an absorption electrode (302) to attract the charged low specific resistance substance to enable the charged low specific resistance substance to move to the absorption electrode (302). The low specific resistance substance is charged by the manner of conducting the electrons, the problem caused by the low specific resistance substance easily losing power after being charged is overcome, so that the low specific resistance substance can quickly obtain electrons after losing the electrons, the probability of enabling the low specific resistance substance to be charged is increased, and the low specific resistance substance remains charged; the adsorption electrode (302) can continue to exert an attractive force on the low specific resistance substance to adsorb the low specific resistance sub-

stance, and enables the low specific resistance substance treatment method to have a strong collection capacity and high collection efficiency for the low specific resistance substances.

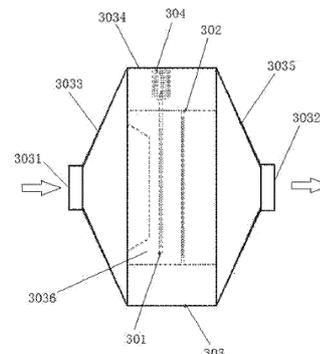


Fig. 1

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**Description****Technical Field**

5 **[0001]** The present invention relates to a low specific resistance substance treatment method and treatment device, in particular to a low specific resistance substance treatment method and treatment device with higher efficiency for collecting low specific resistance substances.

**Background Art**

10 **[0002]** At present, in the field of environmental protection, after dedusting, desulfurization, denitration, demisting, and the like, black smoke, blue smoke and yellow smoke discharged by a chimney do not exist, but white smoke appears. Most of the components of the white smoke are water mist, and fine particles, ammonium salt, calcium, nitric acid, aerosol, and the like are also contained which are the main pollutants to be solved urgently at present. The currently  
15 used cyclone dust collector, bag dust collector, condensation demister, wet electric precipitator, acid mist demister, and the like are substantially ineffective. For example, at the end of ozone denitration and wet flue gas treatment of boilers and sintering machines, a demister is used to remove the water carried by the flue gas. However, the actual demister cannot achieve the removal effect at all due to temperature difference and fine mist characteristics. At present, the wet electrostatic precipitator is mainly used as a treatment means. But due to the deviation of the structure and the charging principle, the water mist cannot be charged and adsorbed such that the efficiency for treating the white smoke is extremely  
20 low. In this way, a large number of the above-mentioned pollutants is discharged into the atmosphere to form haze and acid rain. Escape dust, ammonium salt, desulfurizer, denitration agent, phenol, high-valence heavy metal, and other entrainment dischargings seriously affect the health of local people. At the same time, a large amount of industrial water is discharged, which is not conducive to saving water resources.

25 **[0003]** The discharged water mist is a low specific resistance substance, and the existing technology for treating the low specific resistance substance has the problem caused by the low specific resistance substance easily losing power after being charged such that the low specific resistance substance discharged into the air can not be removed. For example, the problem of acid mist purification and collection in industrial tail gas is still a current technical problem to be solved urgently.

**Summary of the Invention**

30 **[0004]** In view of the above-mentioned disadvantages of the prior art, the technical problem to be solved by the present invention is to provide a low specific resistance substance treatment method and treatment device, which can collect  
35 the low specific resistance substances and has high collection efficiency.

**[0005]** To achieve the above objects and other related objects, the present invention provides the following examples.

40 1. Example 1 provided by the present invention: a low specific resistance substance treatment method, including the following steps of:

conducting electrons to the low specific resistance substance by using a conductive electrode to charge the low specific resistance substance;  
and attracting charged low specific resistance substance by using an adsorption electrode such that the charged low specific resistance substance moves to the adsorption electrode.

45 2. Example 2 provided by the present invention: includes the low specific resistance substance treatment method of Example 1, wherein a step of conducting electrons to the low specific resistance substance by using a conductive electrode comprises: electrons are transferred between low specific resistance substances located between the conductive electrode and the adsorption electrode such that more low specific resistance substances are charged.

50 3. Example 3 provided by the present invention: includes the low specific resistance substance treatment method according to Example 1 or 2, wherein electrons are conducted between the conductive electrode and the adsorption electrode through the low specific resistance substance, and an electric current is formed.

4. Example 4 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-3, wherein the step of conducting electrons to the low specific resistance substance by using a conductive electrode comprises: the conductive electrode charging the low specific resistance substance by contacting the low specific resistance substance.

55 5. Example 5 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-4, wherein the conductive electrode has a shape of a facet, mesh, perforated

plate, plate, spherical cage, box, or tube.

6. Example 6 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-5, wherein the conductive electrode is one or a combination of more than one states of a solid, a liquid, a gas molecular group, a plasma, a conductive mixed state substance, an organism naturally mixed conductive substance, or an object artificially machined to form a conductive substance.

7. Example 7 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-6, wherein the conductive electrode is solid metal, graphite, or an ion-containing conductive liquid.

8. Example 8 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-7, wherein the adsorption electrode has a shape of a multilayer mesh, mesh, perforated plate, tube, barrel, spherical cage, box, plate, particle stacked stratiform shape, or bent plate.

9. Example 9 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-8, wherein at least one through-hole is provided on the conductive electrode.

10. Example 10 provided by the present invention: includes the low specific resistance substance treatment method according to Example 9, wherein the step of conducting electrons to the low specific resistance substance by using a conductive electrode comprises: enabling the low specific resistance substance to pass through the through-hole of the conductive electrode to charge the low specific resistance substance.

11. Example 11 provided by the present invention: includes the low specific resistance substance treatment method according to Example 9 or Example 10, wherein the through-hole on the conductive electrode has a polygonal, circular, oval, square, rectangular, trapezoidal, or diamond shape.

12. Example 12 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 9-11, wherein the aperture of the through-hole on the conductive electrode is 0.1-3mm.

13. Example 13 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-12, wherein at least one through-hole is provided on the adsorption electrode.

14. Example 14 provided by the present invention: includes the low specific resistance substance treatment method according to Example 13, wherein the through-hole on the adsorption electrode has a polygonal, circular, oval, square, rectangular, trapezoidal, or diamond shape.

15. Example 15 provided by the present invention: includes the low specific resistance substance treatment method according to Example 13 or Example 14, wherein the aperture of the through-hole on the adsorption electrode is 0.1-3mm.

16. Example 16 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-15, wherein the adsorption electrode is made of a conductive substance or the surface of the adsorption electrode has a conductive substance.

17. Example 17 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-16, wherein an electric field is formed between the conductive electrode and the adsorption electrode.

18. Example 18 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-17, wherein the conductive electrode is perpendicular or parallel to the adsorption electrode.

19. Example 19 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-18, wherein the conductive electrode is mesh-shaped, the adsorption electrode is faced, and the conductive electrode is parallel to the adsorption electrode.

20. Example 20 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-19, wherein the conductive electrode and the adsorption electrode are both facets, and the conductive electrode is parallel to the adsorption electrode.

21. Example 21 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-20, wherein the conductive electrode adopts a wire mesh.

22. Example 22 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-21, wherein the conductive electrode is planar or spherical faced.

23. Example 23 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-22, wherein the adsorption electrode is curved faced or spherical faced.

24. Example 24 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-23, wherein the conductive electrode is electrically connected to one electrode of a power-on power supply, and the adsorption electrode is electrically connected to another electrode of the power-on power supply.

25. Example 25 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1 to 24, wherein the conductive electrode is electrically connected to a negative

electrode of the power-on power supply, and the adsorption electrode is electrically connected to a positive electrode of the power-on power supply.

26. Example 26 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1 to 25, wherein the power-on driving voltage of the power-on power supply may range from 5KV to 50KV.

27. Example 27 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-26, wherein the power-on driving voltage of the power-on power supply is less than the onset corona inception voltage.

28. Example 28 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-27, wherein the power-on driving voltage of the power-on power supply is 0.1-2kv/mm.

29. Example 29 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-28, wherein the power-on driving voltage waveform of the power-on power supply is a direct current waveform, a sine wave, or a modulation waveform.

30. Example 30 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-29, wherein the power supply is an alternating current power supply and the variable frequency pulse range of the power-on power supply is 0.1Hz-5GHz.

31. Example 31 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-0, wherein both the conductive electrode and the adsorption electrode extend in the left-right direction, and the left end of the conductive electrode is located on the left of the left end of the adsorption electrode.

32. Example 32 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-31, wherein there are two adsorption electrodes, and the conductive electrode is located between the two adsorption electrodes.

33. Example 33 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-32, wherein the conductive electrode and the adsorption electrode constitute an adsorption unit, and there are multiple adsorption units.

34. Example 34 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-33, wherein all adsorption units are distributed in one or more directions of a longitudinal direction, a transverse direction, an oblique direction, and a spiral direction.

35. Example 35 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-34, wherein both the conductive electrode and the adsorption electrode are mounted in one shell having an inlet and an outlet.

36. Example 36 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-35, further comprising a flow channel located in the shell between the inlet and the outlet.

37. Example 37 provided by the present invention: includes the low specific resistance substance treatment method according to Example 35 or Example 36, wherein the inlet is circular and the diameter of the inlet is 300-1000mm, or 500mm.

38. Example 38 provided by the present invention: includes the low specific resistance substance treatment method according to Example 35 or Example 36, wherein the outlet is circular and the diameter of the outlet is 300-1000mm, or 500mm.

39. Example 39 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-38, wherein the shell is made of a metal, a non-metal, a conductor, a non-conductor, water, various conductive liquids, various porous materials, or various foam materials.

40. Example 40 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-39, wherein the shell is made of stainless steel, aluminum alloy, iron alloy, conductive liquid, cloth, sponge, molecular sieve, activated carbon, foamed iron, or foamed silicon carbide.

41. Example 41 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-40, wherein the shell includes a first barrel body, a second barrel body, and a third barrel body which are sequentially distributed from the inlet to the outlet, and the inlet is located at one end of the first barrel body, and the outlet is located at one end of the third barrel body.

42. Example 42 provided by the present invention: includes the low specific resistance substance treatment method according to Example 41, wherein the profile size of the first barrel body gradually increases from the inlet to the outlet.

43. Example 43 provided by the present invention: includes the low specific resistance substance treatment method according to Example 41 or Example 42, wherein the first barrel body is straight tubular shaped.

44. Example 44 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 41-43, wherein the second barrel body is straight tubular shaped, and the con-

ductive electrode and the adsorption electrode are mounted in the second barrel body.

45. Example 45 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 41-44, wherein the profile size of the third barrel body gradually decreases from the inlet to the outlet.

46. Example 46 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 41-45, wherein each cross-section of the second barrel body is rectangular.

47. Example 47 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-46, wherein the conductive electrode is fixedly connected to the shell through an insulating member.

48. Example 48 provided by the present invention: includes the low specific resistance substance treatment method according to Example 47, wherein the insulating member is made of insulating mica.

49. Example 49 provided by the present invention: includes the low specific resistance substance treatment method according to Example 47 or Example 48, wherein the insulating member is columnar or tower-shaped.

50. Example 50 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-49, wherein a first connecting portion is provided on the conductive electrode, and the first connecting portion is fixedly connected to the insulating member.

51. Example 51 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-50, wherein a second connecting portion is provided on the inner wall of the shell, and the second connecting portion is fixedly connected to the insulating member.

52. Example 52 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-51, wherein the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99%-10%, 90-10%, 80-20%, 70-30%, 60-40% or 50%.

53. Example 53 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-52, wherein the low specific resistance substance is one or a combination of more than one states of a liquid state, a mist state, a solid state, or a plasma state.

54. Example 54 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-53, wherein the low specific resistance substance is one or a combination of more than one states of conductive liquid, conductive mist, conductive particle, charged liquid, charged mist, charged particle, water, an emulsion, an aerosol, liquefied dust, multi-substance mixed liquid, multi-state mixed liquid, multi-substance multi-state mixed liquid, water mist, emulsion mist, multi-substance mixed liquid mist, multi-state mixed liquid mist, multi-substance multi-state mixed liquid mist, a haze, steam, acid mist, water-containing tail gas, water-containing flue gas, gaseous state molecular group, ionic group, plasma, conductive powder, conductive spray, conductive dust, ionic group in liquid, ionic group in gas, compounds in liquid, and compounds in gas.

55. Example 55 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-54, wherein the low specific resistance substance is an organism containing water, an emulsion, a multi-substance mixed liquid, a multi-state mixed liquid, or a multi-substance multi-state mixed liquid.

56. Example 56 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-55, wherein the low specific resistance substance is a conductor or a semi-conductor.

57. Example 57 provided by the present invention: includes the low specific resistance substance treatment method according to any one of Examples 1-56, including the following steps:

the low specific resistance substance entering the flow channel from the inlet and moving to an outlet direction; when the low specific resistance substance passes through the conductive electrode, the conductive electrode conducting electrons to the low specific resistance substance, and the low specific resistance substance being charged.

58. Example 58 provided by the present invention: a low specific resistance substance treatment device, including:

a conductive electrode capable of conducting electrons to the low specific resistance substance; when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged; and an adsorption electrode capable of exerting attractive force to charged low specific resistance substance.

59. Example 59 provided by the present invention: includes the low specific resistance substance treatment device according to Example 58, wherein the conductive electrode has a shape of a facet, mesh, perforated plate, plate, spherical cage, box, or tube.

60. Example 60 provided by the present invention: includes the low specific resistance substance treatment device according to Example 58 or Example 59, wherein the conductive electrode is one or a combination of more than one states of a solid, a liquid, a gas molecular group, a plasma, a conductive mixed state substance, an organism naturally mixed conductive substance, or an object artificially machined to form a conductive substance.

5 61. Example 61 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-60, wherein the conductive electrode is solid metal, graphite, or an ion-containing conductive liquid.

62. Example 62 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-61, wherein the adsorption electrode has a shape of a multilayer mesh, mesh, perforated plate, tube, barrel, spherical cage, box, plate, particle stacked stratiform shape, or bent plate.

10 63. Example 63 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-62, wherein at least one through-hole is provided on the conductive electrode.

64. Example 64 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Example 58 -63, wherein the step of conducting electrons to the low specific resistance substance by using a conductive electrode comprises: enabling the low specific resistance substance to pass through the through-hole of the conductive electrode to charge the low specific resistance substance.

15 65. Example 65 provided by the present invention: includes the low specific resistance substance treatment device according to Example 63 or Example 64, wherein the through-hole on the conductive electrode has a polygonal, circular, oval, square, rectangular, trapezoidal, or diamond shape.

20 66. Example 66 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 63-64, wherein the aperture of the through-hole on the conductive electrode is 0.1-3mm.

67. Example 67 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-66, wherein at least one through-hole is provided on the adsorption electrode.

25 68. Example 68 provided by the present invention: includes the low specific resistance substance treatment device according to Example 67, wherein the through-hole on the adsorption electrode has a polygonal, circular, oval, square, rectangular, trapezoidal, or diamond shape.

69. Example 69 provided by the present invention: includes the low specific resistance substance treatment device according to Example 67 or Example 68, wherein the aperture of the through-hole on the adsorption electrode is 0.1-3mm.

30 70. Example 70 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-69, wherein the adsorption electrode is made of a conductive substance or the surface of the adsorption electrode has a conductive substance.

35 71. Example 71 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-70, wherein an electric field is formed between the conductive electrode and the adsorption electrode.

72. Example 72 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-71, wherein the conductive electrode is perpendicular or parallel to the adsorption electrode.

40 73. Example 73 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-72, wherein the conductive electrode is mesh-shaped, the adsorption electrode is faced, and the conductive electrode is parallel to the adsorption electrode.

74. Example 74 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-73, wherein the conductive electrode and the adsorption electrode are both facets, and the conductive electrode is parallel to the adsorption electrode.

45 75. Example 75 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-74, wherein the conductive electrode adopts a wire mesh.

76. Example 76 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-75, wherein the conductive electrode is planar or spherical faced.

50 77. Example 77 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-76, wherein the adsorption electrode is curved faced or spherical faced.

78. Example 78 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-77, wherein the conductive electrode is electrically connected to one electrode of a power-on power supply, and the adsorption electrode is electrically connected to another electrode of the power-on power supply.

55 79. Example 79 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58 to 78, wherein the conductive electrode is electrically connected to a negative electrode of the power-on power supply, and the adsorption electrode is electrically connected to a positive electrode

of the power-on power supply.

80. Example 80 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-79, wherein the power-on driving voltage of the power-on power supply may range from 5KV to 50KV.

81. Example 81 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-80, wherein the power-on driving voltage of the power-on power supply is less than the onset corona inception voltage.

82. Example 82 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-81, wherein the power-on driving voltage of the power-on power supply is 0.1kv/mm-2kv/mm.

83. Example 83 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-82, wherein the power-on driving voltage waveform of the power-on power supply is a direct current waveform, a sine wave, or a modulation waveform.

84. Example 84 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-83, wherein the power supply is an alternating current power supply and the variable frequency pulse range of the power-on power supply is 0.1Hz-5GHz.

85. Example 85 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-84, wherein both the conductive electrode and the adsorption electrode extend in the left-right direction, and the left end of the conductive electrode is located on the left of the left end of the adsorption electrode.

86. Example 86 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-85, wherein there are two adsorption electrodes, and the conductive electrode is located between the two adsorption electrodes.

87. Example 87 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-86, wherein the conductive electrode and the adsorption electrode constitute an adsorption unit, and there are multiple adsorption units.

88. Example 88 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-87, wherein all adsorption units are distributed in one or more directions of a longitudinal direction, a transverse direction, an oblique direction, or a spiral direction.

89. Example 89 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-88, further comprising a shell having an inlet and an outlet, wherein both the conductive electrode and the adsorption electrode are mounted in the shell.

90. Example 90 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-89, further comprising a flow channel located in the shell between the inlet and the outlet.

91. Example 91 provided by the present invention: includes the low specific resistance substance treatment device according to Example 89 or Example 90, wherein the inlet is circular and the diameter of the inlet is 300-1000mm, or 500mm.

92. Example 92 provided by the present invention: includes the low specific resistance substance treatment device according to Example 89 or Example 90, wherein the outlet is circular and the diameter of the outlet is 300-1000mm, or 500mm.

93. Example 93 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-92, wherein the shell is made of a metal, a non-metal, a conductor, a non-conductor, water, various conductive liquids, various porous materials, or various foam materials.

94. Example 94 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-93, wherein the shell is made of stainless steel, aluminum alloy, iron alloy, conductive liquid, cloth, sponge, molecular sieve, activated carbon, foamed iron, or foamed silicon carbide.

95. Example 95 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-94, wherein the shell includes a first barrel body, a second barrel body, and a third barrel body which are sequentially distributed from the inlet to the outlet, and the inlet is located at one end of the first barrel body, and the outlet is located at one end of the third barrel body.

96. Example 96 provided by the present invention: includes the low specific resistance substance treatment device according to Example 95, wherein the profile size of the first barrel body gradually increases from the inlet to the outlet.

97. Example 97 provided by the present invention: includes the low specific resistance substance treatment device according to Example 95 or Example 96, wherein the first barrel body is straight tubular shaped.

98. Example 98 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 95-97, wherein the second barrel body is straight tubular shaped, and the conductive electrode and the adsorption electrode are mounted in the second barrel body.

99. Example 99 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 95-98, wherein the profile size of the third barrel body gradually decreases from the inlet to the outlet.

100. Example 100 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 95-99, wherein each cross-section of the second barrel body is rectangular.

101. Example 101 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-100, wherein the conductive electrode is fixedly connected to the shell through an insulating member.

102. Example 102 provided by the present invention: includes the low specific resistance substance treatment device according to Example 39-101, wherein the insulating member is made of insulating mica.

103. Example 103 provided by the present invention: includes the low specific resistance substance treatment device according to Example 101 or Example 102, wherein the insulating member is columnar or tower-shaped.

104. Example 104 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-103, wherein a first connecting portion is provided on the conductive electrode, and the first connecting portion is fixedly connected to the insulating member.

105. Example 105 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-104, wherein a second connecting portion is provided on the inner wall of the shell, and the second connecting portion is fixedly connected to the insulating member.

106. Example 106 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-105, wherein the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99%-10%, 90-10%, 80-20%, 70-30%, 60-40% or 50%.

107. Example 107 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-106, wherein the low specific resistance substance is one or a combination of more than one states of a liquid state, a mist state, a solid state, or a plasma state.

108. Example 108 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-107, wherein the low specific resistance substance is one or a combination of more than one states of conductive liquid, conductive mist, conductive particle, charged liquid, charged mist, charged particle, water, an emulsion, an aerosol, liquefied dust, multi-substance mixed liquid, multi-state mixed liquid, multi-substance multi-state mixed liquid, water mist, emulsion mist, multi-substance mixed liquid mist, multi-state mixed liquid mist, multi-substance multi-state mixed liquid mist, a haze, steam, acid mist, water-containing tail gas, water-containing flue gas, gaseous state molecular group, ionic group, plasma, conductive powder, conductive spray, conductive dust, ionic group in liquid, ionic group in gas, compounds in liquid, and compounds in gas.

109. Example 109 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-108, wherein the low specific resistance substance is an organism containing water, an emulsion, a multi-substance mixed liquid, a multi-state mixed liquid, or a multi-substance multi-state mixed liquid.

110. Example 110 provided by the present invention: includes the low specific resistance substance treatment device according to any one of Examples 58-109, wherein the low specific resistance substance is a conductor or a semiconductor.

111. Example 111 provided by the present invention: includes the low specific resistance substance treatment device used for any one of Examples 58-110: including an inlet, an outlet, and a flow channel between the inlet and the outlet, wherein a conductive electrode capable of conducting electrons to the low specific resistance substance is mounted in the flow channel; the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99%-10%, and the low specific resistance substance treatment device further includes an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

**[0006]** The working principle of a low specific resistance substance treatment device according to the present invention is: conducting electrons to the low specific resistance substance by using the conductive electrode to charge the low specific resistance substance, and exerting attractive force to the charged low specific resistance substance by using the adsorption electrode to attract the low specific resistance substance to move to the adsorption electrode until the low specific resistance substance is attached to the adsorption electrode such that the low specific resistance substances are collected to an adsorption plate; and meanwhile, according to the low specific resistance substance treatment device according to the present invention, charging the low specific resistance substance via the mode of conducting electrons such that the problem caused by the low specific resistance substance easily losing power after being charged is overcome, the low specific resistance substance can quickly obtain electrons after losing electrons, the probability of charging the low specific resistance substance is increased, and the low specific resistance substance is enabled to remain charged so that the adsorption electrode can continuously exert attractive force to the low specific resistance substance to adsorb the low specific resistance substance, and the low specific resistance substance treatment device

is enabled to have stronger collection capacity and higher collection efficiency on the low specific resistance substance.

**[0007]** The low specific resistance substance treatment method provided by the present invention can collect low specific resistance substances, and the collection efficiency is higher.

**[0008]** As mentioned above, the treatment method that the present invention relates to has beneficial effects as follows:

Based on the method mentioned above, according to the present invention, low specific resistance substances are collected to the adsorption plate; in addition, the treatment method overcomes the problem caused by the low specific resistance substance easily losing power after being charged, and the low specific resistance substance is enabled to quickly obtain electrons after losing electrons to ensure that the low specific resistance substance remains charged, and at that, the adsorption electrode can continuously exert attractive force to the low specific resistance substance to adsorb the low specific resistance substance, and further, the treatment method has higher collection efficiency for low specific resistance substance.

**[0009]** The conductive electrode is mounted in the flow channel according to the present invention, and the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99%-10% such that the conductive electrode can effectively conduct electrons to the low specific resistance substance.

### Brief Description of the Drawings

#### [0010]

Fig. 1 is a schematic view showing a structure of a low specific resistance substance treatment device according to a first embodiment of the present invention.

Fig. 2 is a left view of a low specific resistance substance treatment device according to a first embodiment of the present invention.

Fig. 3 is a perspective view of a low specific resistance substance treatment device according to a first embodiment of the present invention.

Fig. 4 is a schematic view showing a structure of a low specific resistance substance treatment device according to a second embodiment of the present invention.

Fig. 5 is a top view of a low specific resistance substance treatment device according to a second embodiment of the present invention.

Fig. 6 is a schematic view showing a structure of an intake device of an engine-based gas treatment system according to a twentieth embodiment of the present invention in an embodiment.

Fig. 7 is a schematic view showing a structure of another embodiment of a first water filtering mechanism provided in an intake device in an engine-based gas treatment system according to a twentieth embodiment of the present invention.

Fig. 8 is a schematic view showing a principle structure of a tail gas treatment system of a diesel engine according to a twenty-first embodiment of the embodiments of the present invention.

#### Description of element reference numbers

#### [0011]

301	Conductive Electrode
3011	First Connecting Portion
302	Adsorption Electrode
303	Shell
3031	Inlet
3032	Outlet
3033	First Barrel Portion
3034	Second Barrel Portion
3035	Third Barrel Portion
3036	Flow Channel
304	Insulating Member
101	Intake Device
1011	Air Inlet
1012	Separating Mechanism
1013	First Water Filtering Mechanism
1014	Electrostatic Dust Removing Mechanism
10141	Anode Dirt Retention Portion

10142	Cathode Discharging Portion
1015	First Insulating Mechanism
1016	Uniform Wind Mechanism
1017	Second Water Filtering Mechanism
5 1018	Ozone Mechanism
201	Ozone Generator
202	Reaction Field
2021	Honeycomb Cavity
2022	Gap
10 203	Denitration Device
2031	Electrocoagulation Demisting Unit
2032	Denitration Liquid Collecting Unit
204	Ozone Digester

15 **Detailed Description of the Invention**

20 [0012] Through extensive research, the inventors of the present invention provide the following low specific resistance substance treatment method and treatment device. The low specific resistance substance treatment method and treatment device can collect low specific resistance substances, and the collection efficiency is high. Meanwhile, the low specific resistance substance in the present invention refers to a substance with a resistance of less than  $1 \times 10^9$  ohm per unit volume, the unit volume referring to cubic centimeter; that is, the resistance of the low specific resistance substance is less than  $1 \times 10^9$  ohm per cubic centimeter.

25 [0013] Some embodiments of the present invention provide a low specific resistance substance treatment device, including:

- a conductive electrode capable of conducting electrons to the low specific resistance substance; and when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;
- and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

30 [0014] The working principle of a low specific resistance substance treatment device according to the present invention is: conducting electrons to the low specific resistance substance by using the conductive electrode to charge the low specific resistance substance, and exerting attractive force to the charged low specific resistance substance by using the adsorption electrode to attract the low specific resistance substance to move to the adsorption electrode until the low specific resistance substance is attached to the adsorption electrode such that the low specific resistance substances are collected to an adsorption plate; and meanwhile, according to the low specific resistance substance treatment device according to the present invention, charging the low specific resistance substance via the mode of conducting electrons such that the problem caused by the low specific resistance substance easily losing power after being charged is overcome, the low specific resistance substance can quickly obtain electrons after losing electrons, the probability of charging the low specific resistance substance is increased, and the low specific resistance substance is enabled to remain charged so that the adsorption electrode can continuously exert attractive force to the low specific resistance substance to adsorb the low specific resistance substance, and the low specific resistance substance treatment device is enabled to have stronger collection capacity and higher collection efficiency on the low specific resistance substance.

35 [0015] Meanwhile, the present invention provides a low specific resistance substance treatment method, including the following steps of:

- 45 conducting electrons to the low specific resistance substance by using a conductive electrode to charge the low specific resistance substance;
- and attracting the charged low specific resistance substance by using an adsorption electrode such that the charged low specific resistance substance moves to the adsorption electrode.

50 [0016] According to the treatment method of the present invention, low specific resistance substances are collected to the adsorption plate based on the above-mentioned steps; in addition, the treatment method overcomes the problem caused by the low specific resistance substance easily losing power after being charged, the low specific resistance substance is enabled to quickly obtain electrons after losing electrons to ensure that the low specific resistance substance remains charged, and at that, the adsorption electrode can continuously exert attractive force to the low specific resistance substance to adsorb the low specific resistance substance, and further, the treatment method has higher collection efficiency for low specific resistance substance.

55 [0017] Some embodiments of the present invention provide a low specific resistance substance treatment device,

including an inlet, an outlet, and a flow channel between the inlet and the outlet, wherein a conductive electrode capable of conducting electrons to the low specific resistance substance is mounted in the flow channel; the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99%-10%, and the low specific resistance substance treatment device further includes an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance. The working principle of the low specific resistance substance treatment device according to the present invention is as follows: the low specific resistance substance enters the flow channel from the inlet, the conductive electrode mounted in the flow channel conducts electrons to the low specific resistance substance, the low specific resistance substance is charged, the adsorption electrode exerts attractive force to the charged low specific resistance substance, and the low specific resistance substance moves to the adsorption electrode until the low specific resistance substance is attached to the adsorption electrode such that the low specific resistance substances are collected to the adsorption plate; and meanwhile, the conductive electrode is mounted in the flow channel in the present invention, and the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99%-10% such that the conductive electrode can effectively conduct electrons to the low specific resistance substance; and in addition, according to the low specific resistance substance treatment device according to the present invention, the low specific resistance substance is charged via the mode of conducting electrons such that the problem caused by the low specific resistance substance easily losing power after being charged is overcome, the low specific resistance substance can quickly obtain electrons after losing electrons, the probability of charging the low specific resistance substance is increased, and the low specific resistance substance is enabled to remain charged so that the adsorption electrode can continuously exert attractive force to the low specific resistance substance to adsorb the low specific resistance substance, and the low specific resistance substance treatment device is enabled to have stronger collection capacity and higher collection efficiency on the low specific resistance substance.

**[0018]** Some embodiments of the present invention provide a low specific resistance substance treatment device, including an inlet, an outlet, and a flow channel between the inlet and the outlet, wherein a conductive electrode capable of conducting electrons to the low specific resistance substance is mounted in the flow channel; the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99%-10%, and the low specific resistance substance treatment device further includes an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

**[0019]** Some embodiments of the present invention provide the low specific resistance substance treatment method, including the following steps.

**[0020]** The low specific resistance substance enters the flow channel from the inlet and moves to the outlet direction; when the low specific resistance substance passes through the conductive electrode, the conductive electrode conducts electrons to the low specific resistance substance, and the low specific resistance substance is charged; an adsorption electrode is used for attracting the charged low specific resistance substance such that the charged low specific resistance substance moves to the adsorption electrode.

**[0021]** According to the low specific resistance substance treatment method of the present invention, low specific resistance substances are collected to the adsorption plate based on the above-mentioned steps; and meanwhile, the conductive electrode is mounted in the flow channel in the present invention, and the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99-10% such that the low specific resistance substance passes through the conductive electrode, the contact area between the low specific resistance substance and the conductive electrode is increased, and the conductive electrode can effectively conduct electrons to the low specific resistance substance. The treatment method overcomes the problem caused by the low specific resistance substance easily losing power after being charged, the low specific resistance substance is enabled to quickly obtain electrons after losing electrons to ensure that the low specific resistance substance remains charged, and at that, the adsorption electrode can continuously exert attractive force to the low specific resistance substance to adsorb the low specific resistance substance, and further, the treatment method has higher collection efficiency for low specific resistance substance.

**[0022]** In one embodiment of the present invention, the conductive electrode is located in the flow channel. The cross-sectional area of the conductive electrode in the present invention is the sum of the areas of the conductive electrode along the solid portion of the cross-section. In addition, the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel in some embodiments of the present invention may be 99-10%, or 90-10%, or 80-20%, or 70-30%, or 60-40%, or 50%.

**[0023]** The form of the low specific resistance substance of the present invention may be one or a combination of more than one of a liquid state, a mist state, a solid state, or a plasma state. For example, the low specific resistance substance of the present invention may be conductive liquid, conductive mist, conductive particle, charged liquid, charged mist, charged particle, water, an emulsion, an aerosol, liquefied dust, multi-substance mixed liquid, multi-state mixed liquid, multi-substance multi-state mixed liquid, water mist, emulsion mist, multi-substance mixed liquid mist, multi-state mixed liquid mist, multi-substance multi-state mixed liquid mist, a haze, steam, acid mist, water-containing tail gas, water-containing flue gas, gaseous state molecular group, ionic group, plasma, conductive powder, conductive spray, con-

ductive dust, ionic group in liquid, ionic group in gas, compounds in liquid, compounds in gas, and the like. The low specific resistance substance of the present invention can also be an organism containing water, an emulsion, multi-substance mixed liquid, multi-state mixed liquid, or multi-substance multi-state mixed liquid. The low specific resistance substance of the present invention may be a conductor or a semiconductor. The low specific resistance substance can be collected to the adsorption electrode via the above-mentioned treatment method of the present invention. According to the present invention, the treatment device can be used as an electrocoagulation demister and can be applied to ozone denitration tail gas recovery, wet desulphurization flue gas dehydration, wet dedusting escape water recovery, industrial tail gas demister, emulsion purifier, oil mist purifier, electronic cigarette, and nuclear fusion restraint device. For example, when the treatment device is applied to ozone denitration tail gas recovery, the acid mist formed in the ozone denitration tail gas is a low specific resistance substance, and the resistance of the tail gas containing the acid mist per cubic centimeter is 0.1 to 1000 ohms; at the time, the low specific resistance substance treatment method specifically includes steps as follows: the ozone denitration tail gas flows through the conductive electrode, and the conductive electrode conducts electrons to the acid mist in the ozone denitration tail gas and electrifies the acid mist; the adsorption electrode exerts attractive force to the charged acid mist; the acid mist moves to the adsorption electrode and is attached to the adsorption electrode such that the acid mist in the ozone denitration tail gas is recovered, and the acid mist in the ozone denitration tail gas is prevented from being directly discharged to the atmosphere and polluting the atmosphere. At the time, the above-mentioned treatment method is also referred to as an acid mist static electricity recovery method. The treatment device and treatment method of the present invention can be used for whitening treatment of escape mist, aerosol, and the like discharged by chimneys of power plants, glass plants, steel plants, and chemical plants. The present invention solves the problem that the traditional wet electric precipitator cannot remove low specific resistance substances contained in the discharged gas, including water mist, acid mist, aerosol, emulsion, liquefied dust, and the like, and directly utilizes an electric field to adsorb and recover the low specific resistance substances contained in the tail gas by adopting a space power-on mode. In addition, the treatment method and device of the present invention can also be used for separating or enriching a target substance, i.e., low specific resistance substance, from the gaseous phase, a liquid phase, or a sol body. According to one embodiment of the present invention, the conductive electrode is electrically connected to one electrode of the power supply; the adsorption electrode is electrically connected to the other electrode of the power supply. According to one embodiment of the present invention, the conductive electrode is specifically electrically connected to the negative electrode of the power supply, and the adsorption electrode is specifically electrically connected to the positive electrode of the power supply.

**[0024]** According to the power-on mode of the low specific resistance substance of the present invention, positive electrons or negative electrons are conducted into the low specific resistance substance through the conductive electrode such that through the power-on mode, the low specific resistance substance can quickly obtain electrons after easily losing power, the low specific resistance substance is enabled to remain charged, and the adsorption electrode can continuously attract the low specific resistance substance to adsorb the low specific resistance substance. Meanwhile, the conductive electrode of the present invention can have a positive potential or a negative potential; when the conductive electrode has a positive potential, the adsorption electrode has a negative potential; when the conductive electrode has a negative potential, the adsorption electrode has a positive potential, the conductive electrode and the adsorption electrode of the present invention are both electrically connected to a power-on power supply, and specifically, the conductive electrode and the adsorption electrode can be respectively electrically connected to the positive electrode and the negative electrode of the power-on power supply. The voltage of the power-on power supply is called a power-on driving voltage, and the size of the power-on driving voltage is selected in relation to the ambient temperature, the medium temperature, and the like. For example, the range of the power-on driving voltage of the power-on power supply may be 5-50KV, 10-50KV, 5-10KV, 10-20KV, 20-30KV, 30-40KV, or 40-50KV, from bioelectricity to spatial haze treatment electricity consumption. The power-on power supply may be a direct current power supply or an alternating current power supply, and the waveform of the power-on driving voltage may be a direct current, a sine wave, or a modulation waveform. The direct current power supply serves as the basic application of adsorption; the sine wave is used as the movement, for example, the power-on driving voltage of the sine wave acts between the conductive electrode and the adsorption electrode, and the generated electric field moves charged particles in the driving electric field, such as fogdrops and the like, to the adsorption electrode; the oblique wave is used as pulling, and the waveform needs to be modulated according to the pulling force, and as at the edges of the two ends of the asymmetric electric field, the pulling force generated by the medium therein has significant directionality to drive the medium in the electric field to move in that direction. When the alternating current power supply is used in the power-on power supply, the range of the frequency conversion pulses can be 0.1Hz-5GHz, 0.1Hz-1Hz, 0.5Hz-10Hz, 5Hz-100Hz, 50Hz-1KHz, 1KHz-100KHz, 50KHz-1MHz, 1MHz-100MHz, 50MHz-1GHz, 500MHz-2GHz, or 1GHz-5GHz, suitable for the adsorption of organisms to contaminant particles. The conductive electrode of the present invention can be used as a conductive wire such that positive electrons and negative electrons are directly conducted into a low specific resistance substance when the conductive electrode is in contact with the low specific resistance substance, and at the time the low specific resistance substance itself can serve as an electrode. In the procedure that the low specific resistance substance moves from the conductive electrode

to the adsorption electrode according to the present invention, electrons are repeatedly obtained and lost; at the same time, a large number of electrons are transferred between a plurality of low specific resistance substances located between the conductive electrode and the adsorption electrode, and finally reach the adsorption electrode, thereby forming a current, which is also referred to as a power-on driving current. The magnitude of the power-on driving current is related to the ambient temperature, the medium temperature, the electron quantity, the adsorbed substance quantity, and the escaping quantity. For example, as the electron quantity increases, the number of movable particles, such as fogdrops, increases, and the current formed by the movable charged particles increases accordingly. The more charged substances, such as fogdrops, adsorbed per unit time, the larger the current. The escaped fogdrops are only charged, but do not reach the adsorption electrode. That is, no effective charge neutrality is formed, so that under the same conditions, the more escaped fogdrops are, the smaller the current is. Under the same conditions, the higher the ambient temperature is, the faster the velocity of the gas particles and fogdrops is, the higher the kinetic energy of the gas particles and fogdrops is, the higher the collision probability of the gas particles and fogdrops with the conductive electrode and the adsorption electrode is, and the less easily they are adsorbed by the adsorption electrode, thereby generating escape. But because the escape occurs after the charge neutrality and possibly after repeated charge neutralities, the electron conducting velocity is accordingly increased, and the current is accordingly increased. Meanwhile, the higher the ambient temperature is, the higher the momentum of gas molecules, fogdrops, and the like is, and the less easily they are absorbed by the adsorption electrode, even after the adsorption electrode adsorbs, the higher the probability of escaping from the adsorption electrode again, i.e. escaping after charge neutrality, is. Therefore, under the condition that the distance between the conductive electrode and the adsorption electrode is unchanged, the power-on driving voltage needs to be increased, and the limit of the power-on driving voltage is to achieve the effect of air breakdown. In addition, the effect of the medium temperature is substantially comparable to that of the ambient temperature. The lower the medium temperature is, the smaller the energy required to excite the medium, such as fogdrops to charge is, the smaller the kinetic energy that the medium has is, the more easily the medium is adsorbed to the adsorption electrode under the same electric field force, and the larger the formed current is. The treatment device in the present invention has a better adsorption effect on cold substances. With the increasing concentration of the medium, such as fogdrops, the probability that the charged medium has generated electron transfer with other mediums before colliding with the adsorption electrode is larger such that the chance of forming effective charge neutrality is larger, and the formed current is correspondingly larger; therefore, the higher the concentration of the medium is, the larger the formed current is. The relationship between the power-on driving voltage and the medium temperature is substantially the same as that between the power-on driving voltage and the ambient temperature.

**[0025]** According to one embodiment of the present invention, the power-on driving voltage of a power-on power supply can be smaller than the onset corona inception voltage of the discharge inception power supply. Under the condition that corona discharge does not exist, the conductive electrode of the present invention can also charge the low specific resistance substance so that the electricity can be conducted without ionization; when the power-on driving voltage can be larger than the onset corona inception voltage of the discharge inception power supply, the corona discharge and the conductive electrode conduct electrons to the low specific resistance substance such that the low specific resistance substance is charged and simultaneously exists. The discharge inception power supply is a power supply that enables the conductive electrode or the adsorption electrode to generate discharge if both the conductive electrode and the adsorption electrode are electrically connected to the discharge inception power supply, and ionizes gas when the conductive electrode or the adsorption electrode generates discharge such that substances such as smoke dust particles in the gas obtain negative charge. The voltage of the discharge inception power supply is called discharge inception voltage, and the minimum value of the discharge inception voltage is called onset corona inception voltage; that is, under the condition that both the conductive electrode and the adsorption electrode are electrically connected to the discharge inception power supply, the minimum voltage value at which the conductive electrode or the adsorption electrode can generate discharge and ionize the gas is called the onset corona inception voltage. The magnitudes of the onset corona inception voltages may be different for different gases, different working environments, etc. However, for a person skilled in the art, with regard to determined gas and working environment, the corresponding onset corona inception voltage is determined. Meanwhile, in some embodiments of the present invention, the power-on driving voltage may specifically be 0.1-2kv/mm. The power-on driving voltage of the power-on power supply is smaller than the discharge inception voltage of air corona. In addition, the low specific resistance substance treatment method of the present invention can be applied to the treatment of tail gas of an engine, and particularly the low specific resistance substance treatment device and treatment method of the present invention can be used for treating low specific resistance substances such as water mist and the like in the tail gas of the engine.

**[0026]** In one embodiment of the present invention, both the conductive electrode and the adsorption electrode extend in the left-right direction, and the left end of the conductive electrode is located to the left of the left end of the adsorption electrode.

**[0027]** In one embodiment of the present invention, there are two adsorption electrodes, and the conductive electrode is located between two adsorption electrodes.

**[0028]** According to the present invention, the distance between the conductive electrode and the adsorption electrode can be set according to the power-on driving voltage magnitude between the conductive electrode and the adsorption electrode, the flow rate of the low specific resistance substance, the charging capacity of the low specific resistance substance, and the like. For example, the distance between the conductive electrode and the adsorption electrode may be 5-50mm, 5-10mm, 10-20mm, 20-30mm, 30-40mm, or 40-50mm. The larger the distance between the conductive electrode and the adsorption electrode is, the higher the required power-on driving voltage is, to form a strong enough electric field for driving the charged medium to quickly move to the adsorption electrode to prevent the medium from escaping. Under the same condition, the larger the distance between the conductive electrode and the adsorption electrode is, the closer to the central position, the faster the substance flow rate is along the gas flow direction; the closer the substance is to the adsorption electrode, the slower the flow rate of the substance is; in the direction perpendicular to the gas flow direction, the longer the time the charged medium particles, such as mist particles are accelerated by the electric field as the distance between the conductive electrode and the adsorption electrode increases under the condition of no collisions, and therefore, the larger the moving velocity of the substance in the perpendicular direction is before the substance is near the adsorption electrode. Under the same conditions, if the power-on driving voltage is not changed, the strength of the electric field decreases gradually with the increase of the distance, and the weaker the charging capacity of the medium in the electric field is.

**[0029]** In some embodiments of the present invention, the conductive electrode may be one or a combination of more than one of a solid, a liquid, a gas molecular layer, or plasma. When the conductive electrode is solid, the conductive electrode can be made of solid metal, such as 304 steel, or other solid conductors, such as graphite, and the like; when the conductive electrode is a liquid, the conductive electrode may be an ion-containing conductive liquid. In addition, in some embodiments of the present invention, the conductive electrode can also be a conductive mixed state substance, an organism naturally mixed conductive substance, and an object artificially machined to form a conductive substance. In the present invention, the adsorption electrode is made of a conductive substance, or the surface of the adsorption electrode has a conductive substance.

**[0030]** In some embodiments of the present invention, the conductive electrode may have a shape of a facet, mesh, perforated plate, plate, spherical cage, box, or tube. The mesh in the present invention is in a shape that includes any porose structure. When the conductive electrode is in the form of a plate, a spherical cage, a box or a tube, the conductive electrode may be of a non-porose structure or a porose structure. When the conductive electrode is of a porose structure, one or more through-holes can be formed in the conductive electrode, and the through-holes in the conductive electrode can have a polygonal, circular, oval, square, rectangular, trapezoidal, diamond shape, and the like. The through-hole on the conductive electrode may have a profile size of 0.1-3mm, 0.1-0.3mm, 0.3-0.5mm, 0.5-0.8mm, 0.8-1.0mm, 1.0-1.2mm, 1.2-1.0mm, 1.0-1.5mm, 1.5-1.8mm, 1.8-2.0mm, 2.0-2.3mm, 2.3-2.5mm, 2.5-2.8mm, or 2.8-3.0mm. In addition, in some embodiments of the present invention, the conductive electrode may have a shape of other natural states of the substance, or machined states of the substance. In the present invention, when the low specific resistance substance passes through the through-hole on the conductive electrode, the low specific resistance substance passes through the conductive electrode, the contact area of the low specific resistance substance and the conductive electrode is improved, and the charging efficiency is increased. In the present invention, the through-hole in the conductive electrode is any hole that allows a substance to flow through the conductive electrode.

**[0031]** Meanwhile, in some embodiments of the present invention, the adsorption electrode may have a shape of a multilayer mesh, mesh, perforated plate, tube, barrel, spherical cage, box, plate, particle stacked stratiform shape, bent plate, or panel. When the adsorption electrode is in the form of a plate, spherical cage, box, or tube, the adsorption electrode may also be a non-porose structure, or a porose structure. When the adsorption electrode is of a porose structure, one or more through-holes can be formed in the adsorption electrode, and the through-hole of the adsorption electrode can have a polygonal, circular, oval, square, rectangular, trapezoidal, rhombic shape, or the like. The through-hole in the adsorption electrode may have a profile size of 0.1-3mm, 0.1-0.3mm, 0.3-0.5mm, 0.5-0.8mm, 0.8-1.0mm, 1.0-1.2mm, 1.2-1.0mm, 1.0-1.5mm, 1.5-1.8mm, 1.8-2.0mm, 2.0-2.3mm, 2.3-2.5mm, 2.5-2.8mm, or 2.8-3.0mm. In the present invention, the through-hole in the adsorption electrode is any hole that allows a substance to flow through the adsorption electrode.

**[0032]** In some embodiments of the present invention, an electric field is formed between the conductive electrode and the adsorption electrode, and the electric field can be various electric fields such as a mesh surface electric field or a mesh barrel electric field. For example: the conductive electrode is in a mesh shape, the adsorption electrode is faced, and the conductive electrode is parallel to the adsorption electrode to form a mesh surface electric field; or the conductive electrode is in a mesh shape and fixed through a metal wire or a metal needle, the adsorption electrode is in a barrel shape, and the conductive electrode is located at the geometric symcenter of the adsorption electrode such that a mesh barrel electric field is formed. When the adsorption electrode is faced, it may specifically be a plane, curved face, or spherical face. When the conductive electrode is in a mesh shape, it may specifically be planar, spherical, or other geometric faces, or rectangular, or an irregular shape. When the adsorption electrode is in a barrel shape, the adsorption electrode can further evolve into various box shapes. The conductive electrode can also be changed accordingly to form

electrodes and an electric field layer jacket.

**[0033]** In one embodiment of the present invention, the conductive electrode is perpendicular to the adsorption electrode. In one embodiment of the present invention, the conductive electrode is parallel to the adsorption electrode. In one embodiment of the present invention, the conductive electrode and the adsorption electrode are both facets, and the conductive electrode is parallel to the adsorption electrode. In one embodiment of the present invention, the conductive electrode adopts a metal wire mesh. In one embodiment of the present invention, the conductive electrode is a plane or spherical face. In one embodiment of the present invention, the adsorption electrode is curved faced or spherical faced. In one embodiment of the present invention, the conductive electrode is in a mesh shape and the adsorption electrode is in a barrel shape. The conductive electrode is located in the adsorption electrode, and the conductive electrode is located on the central symmetry axis of the adsorption electrode.

**[0034]** In the present invention, the conductive electrode and the adsorption electrode constitute an adsorption unit. There may be one or more adsorption units, and the specific number is determined according to actual requirements. In one embodiment, there is one adsorption unit. In another embodiment, there are multiple adsorption units for adsorbing more low specific resistance substances by using multiple adsorption units, thereby improving the efficiency of collecting low specific resistance substances. When there are multiple adsorption units, the distribution form of all the adsorption units can be flexibly adjusted according to requirements; all adsorption units may be the same or different. For example, all of the adsorption units may be distributed in one or more directions of a longitudinal direction, a transverse direction, an oblique direction, and a spiral direction to meet requirements of different air volumes. All of the adsorption units can be distributed in a rectangular array or a pyramid shape. The conductive electrode and adsorption electrode of the various shapes can be freely combined to form an adsorption unit. For example, a linear conductive electrode is inserted into a tubular adsorption electrode to form an adsorption unit and then combined with the linear conductive electrode to form a new adsorption unit, and at the moment, the two linear conductive electrodes can be electrically connected; the new adsorption units are then distributed in one or more directions of the longitudinal, transverse, oblique, and spiral directions. As another example, a linear conductive electrode is inserted into a tubular adsorption electrode to form an adsorption unit, the adsorption units are distributed in one or more directions of the longitudinal, transverse, oblique, and spiral directions to form a new adsorption unit, and the new adsorption unit is combined with the conductive electrodes of various shapes to form a new adsorption unit. In the present invention, the distance between the conductive electrode and the adsorption electrode in the adsorption unit can be randomly adjusted to adapt to requirements of different working voltages and adsorption objects. In the present invention, different adsorption units may be combined. In the present invention, different adsorption units can use the same power-on power supply or different power-on power supplies. When different power-on power supplies are used, the power-on driving voltages of each power-on power supply may be the same or different. In addition, multiple treatment devices can be provided in the present invention, and all the treatment devices can be distributed in one or more directions of the longitudinal, transverse, oblique, and spiral directions.

**[0035]** In one embodiment of the present invention, the low specific resistance substance treatment device further includes a shell. The shell includes an inlet, an outlet, and a flow channel, and two ends of the flow channel are respectively communicated with the inlet and the outlet. In one embodiment of the present invention, the inlet is circular and the diameter of the inlet is 300-1000mm or 500mm. In one embodiment of the present invention, the outlet is circular and the diameter of the outlet is 300-1000mm or 500mm. In one embodiment of the present invention, the shell includes a first barrel body, a second barrel body, and a third barrel body which are sequentially distributed from the inlet to the outlet. The inlet is located at one end of the first barrel body, and the outlet is located at one end of the third barrel body. In one embodiment of the present invention, the profile size of the first barrel body is gradually increased from the inlet to the outlet. In one embodiment of the present invention, the first barrel body is straight tubular shaped. In one embodiment of the present invention, the second barrel body is a straight tube, and the conductive electrode and the adsorption electrode are mounted in the second barrel body. In one embodiment of the present invention, the profile size of the third barrel body is gradually reduced from the inlet to the outlet. In one embodiment of the present invention, the cross-sections of the first barrel body, the second barrel body, and the third barrel body are all rectangular. The cross-section of the second barrel body is rectangular in one embodiment of the present invention. In one embodiment of the present invention, the shell is made of stainless steel, aluminum alloy, iron alloy, cloth, sponge, molecular sieve, activated carbon, foamed iron, or foamed silicon carbide. In one embodiment of the present invention, the conductive electrode is connected to the shell through an insulating member. In one embodiment of the present invention, the insulating member is made of insulating mica. In one embodiment of the present invention, the insulating member is columnar or tower-shaped. In one embodiment of the present invention, the conductive electrode is provided with a cylindrical front connecting portion, and the front connecting portion is fixedly connected to the insulating member. In one embodiment of the present invention, a cylindrical rear connecting portion is provided on the inner wall of the adsorption electrode or the shell, and the rear connecting portion is fixedly connected to the insulating member.

**[0036]** In some embodiments of the present invention, the low specific resistance substance treatment device further includes a shell having an inlet and an outlet, both the conductive electrode and the adsorption electrode being mounted in the shell. In the procedure of collecting low specific resistance substances, the low specific resistance substance

enters the shell from the inlet and moves to the outlet; in the procedure of the low specific resistance substance moving to the outlet, the low specific resistance substance passes through the conductive electrode and is charged; the adsorption electrode adsorbs the charged low specific resistance substance to collect the low specific resistance substance to the adsorption electrode. According to the present invention, the shell is used for guiding the low specific resistance substance to flow through the conductive plate such that the low specific resistance substance is charged by using the conductive electrode, and the adsorption electrode is used for collecting the low specific resistance substances, thereby effectively reducing the quantity of the low specific resistance substance flowing out from the outlet. In some embodiments of the present invention, the shell may be made of metal, non-metal, conductor, non-conductor, water, various conductive liquids, various porous materials, or various foam materials, and the like. When the shell is made of metal, the material can specifically be stainless steel or aluminum alloy, and the like. When the shell is made of non-metal, the material can specifically be cloth, or sponge, and the like. When the shell is made of a conductor, the material can specifically be iron alloy and the like. When the shell is made of a non-conductor, a water layer is formed on the surface of the shell to form an electrode, such as a sand layer after water absorption. When the shell is made of water and various conductive liquids, the shell is static or flowing. When the shell is made of various porous materials, the shell can be specifically made of molecular sieve or activated carbon. When the shell is made of various foam materials, the shell can be specifically made of foamed iron, foamed silicon carbide, and the like. In an embodiment of the present invention, the conductive electrode is fixedly connected to the shell through the insulating member, and the insulating member can be made of insulating mica. Meanwhile, in an embodiment of the present invention, the adsorption electrode is directly electrically connected to the shell in such a way that the shell can have the same potential as that of the adsorption electrode such that the shell can adsorb charged low specific resistance substance, and the shell also constitutes an adsorption electrode. The shell is provided therein with the flow channel, and the conductive electrode is mounted in the flow channel.

**[0037]** When a low specific resistance substance such as water mist is attached to the adsorption electrode, condensation is formed. According to some embodiments of the present invention, the adsorption electrode can extend in the up-down direction such that when the condensation stacked on the adsorption electrode reaches a certain weight, the condensations will flow downwards along the adsorption electrode under the action of gravity and finally aggregate in a set position or device, thereby realizing the recovery of low specific resistance substances attached to the adsorption electrode. The treatment device can be used for refrigerating and demisting. In addition, substances attached to the adsorption plate can also be collected by the manner of an extra electric field. The direction of collecting the substances on the adsorption plate can be the same as or different from that of the airflow. During the specific implementation, the action of gravity is to be fully utilized such that water drops or water layers on the adsorption electrode can flow into a collecting tank as soon as possible; meanwhile, the airflow direction and acting force thereof will be utilized as much as possible to accelerate the velocity of the water flow on the adsorption electrode. Therefore, according to different mounting conditions, and the convenience, economical efficiency, feasibility, and the like of the insulation, the object can be achieved as far as possible without restricting the present invention to a specific direction.

**[0038]** In some embodiments of the present invention, the above-mentioned treatment device may be used independently as an adsorption device for low specific resistance substance. Meanwhile, in some embodiments of the present invention, the treatment device can be combined with a refrigerating device, a catalyzing device, a corona device, a heating device, a centrifugal device, a screening device, an electromagnetic device, an irradiation device, and the like for the use to realize the functions of condensation, catalysis, corona, heating, centrifugation, screening, and the like. In addition, any combination of the above devices may be used as desired in the field.

**[0039]** In addition, the currently existing electrostatic field charging theory utilizes corona discharge to ionize oxygen to generate a large number of negative oxygen ions. The negative oxygen ions are in contact with the dust, the dust is charged, and the charged dust is adsorbed by a heteropole. However, when encountering water mist, metal particles, conductor dust, and other low specific resistance substances, the existing electric field adsorption effect hardly exists. Because the low specific resistance substance easily loses power after being electrified, when the moving negative oxygen ions charge the low specific resistance substance, the low specific resistance substance will lose power quickly. The negative oxygen ions move only once such that the low specific resistance is difficult to recharge after losing power, or the charging mode greatly reduces the probability that the low specific resistance substance is charged. So the low specific resistance substance is in an uncharged state as a whole. In this way, it is difficult for the heteropole to continuously exert adsorption force to the low specific resistance substance, finally causing the adsorption efficiency of the existing electric field to the low specific resistance substance to be extremely low. According to the treatment device and the treatment method in some embodiments of the present invention, instead of charging the low specific resistance substances via electrical charge, electrons are directly transferred to the low specific resistance substances to charge the low specific resistance substances. After a certain low specific resistance substance is charged and loses power, new electrons are quickly transferred to the power lost low specific resistance substances through other low specific resistance substances from the conductive electrode. So the low specific resistance substance can be quickly electrified after losing power, and the charging probability of the low specific resistance substance is greatly increased. This being repeated,

the low specific resistance substance is in an electrified state as a whole, and the adsorption electrode can continuously exert attractive force to the low specific resistance substance until the low specific resistance substance is adsorbed such that the high collection efficiency of the treatment device on the low specific resistance substance is ensured. According to the method for charging the low specific resistance substance adopted by the present invention, corona wires, corona electrodes, corona plates, and the like are not needed such that the whole structure of the treatment device is simplified, and the manufacturing cost of the treatment device is reduced. Meanwhile, by adopting the power-on mode, according to the present invention, a large number of electrons on the conductive electrode are transferred to the adsorption electrode through the low specific resistance substance, and an electric current is formed. The larger the concentration of the low specific resistance substance flowing through the treatment device is, the more easily electrons on the conductive electrode are transferred to the adsorption electrode through the low specific resistance substance, and more electrons are transferred between the low specific resistance substances such that the current formed between the conductive electrode and the adsorption electrode is larger, the charging probability of the low specific resistance substance is higher, and the collection efficiency of the treatment device on the low specific resistance substance is higher. The treatment method in the present invention can be used as a novel method for chimney whitening and demisting. The treatment device in the present invention can be additionally provided on a wet electric dust collector.

**[0040]** One embodiment of the present invention provides a low specific resistance substance treatment method, including the following steps:

passing the low specific resistance substance through the conductive electrode;  
and when the low specific resistance substance flows through the conductive electrode, the conductive electrode charging the low specific resistance substance, the adsorption electrode exerting attractive force to the charged low specific resistance substance, and the low specific resistance substance moving to the adsorption electrode until the low specific resistance substance is attached to the adsorption electrode.

**[0041]** In one embodiment of the present invention, the step of passing the low specific resistance substance through the conductive electrode includes steps as follows: electrons are transferred between the low specific resistance substances located between the conductive electrode and the adsorption electrode to charge more low specific resistance substances.

**[0042]** In one embodiment of the present invention, electrons are conducted between the conductive electrode and the adsorption electrode through a low specific resistance substance, and an electric current is formed.

**[0043]** According to one embodiment of the present invention, the step of passing the low specific resistance substance through the conductive electrode includes steps as follows: the conductive electrode charges the low specific resistance substance by contacting the low specific resistance substance.

**[0044]** In one embodiment of the present invention, the low specific resistance substances attached to the adsorption electrode gather together.

**[0045]** According to one embodiment of the present invention, the gas with nitric acid mist flows through the conductive electrode; when the gas with the nitric acid mist flows through the conductive electrode, the conductive electrode charges the nitric acid mist in the gas, the adsorption electrode exerts attractive force to the charged nitric acid mist, and the nitric acid mist moves to the adsorption electrode until the nitric acid mist is attached to the adsorption electrode.

**[0046]** According to one embodiment of the present invention, the step of conducting electrons into the nitric acid mist by the conductive electrode includes steps as follows: electrons are transferred between the fogdrops located between the conductive electrode and the adsorption electrode such that more fogdrops are charged.

**[0047]** In one embodiment of the present invention, electrons are conducted between the conductive electrode and the adsorption electrode through the nitric acid mist, and an electric current is formed.

**[0048]** According to one embodiment of the present invention, the step of conducting electrons into the nitric acid mist by the conductive electrode includes steps as follows: the conductive electrode charges the nitric acid mist by contacting the nitric acid mist.

**[0049]** In the embodiment of the present invention, one shell is further included, the inlet and the outlet are both provided on the shell, the conductive electrode and the adsorption electrode are both mounted in the shell, and the flow channel is located in the shell between the inlet and the outlet. One embodiment of the present invention provides a low specific resistance substance treatment method, including the following steps:

conducting electrons to the low specific resistance substance by using a conductive electrode to charge the low specific resistance substance;  
and attracting the charged low specific resistance substance by using an adsorption electrode such that the charged low specific resistance substance moves to the adsorption electrode;

**[0050]** The conductive electrode is provided with at least one through-hole, and when the low specific resistance

substance passes through the through-hole in the conductive electrode, the low specific resistance substance passes through the conductive electrode to charge the low specific resistance substance.

**[0051]** In the embodiment of the present invention, the step of conducting electrons to the low specific resistance substance using the conductive electrode includes steps as follows: electrons are transferred between the low specific resistance substances located between the conductive electrode and the adsorption electrode such that more low specific resistance substances are charged.

**[0052]** In the embodiment of the present invention, electrons are conducted between the conductive electrode and the adsorption electrode through the low specific resistance substance, and an electric current is formed to discharge the current for the conductive electrode.

**[0053]** In the embodiment of the present invention, the step of conducting electrons to the low specific resistance substance by using the conductive electrode includes: the conductive electrode charging the low specific resistance substance by contacting the low specific resistance substance.

**[0054]** In one embodiment of the present invention, a conductive electrode and an adsorption electrode are both mounted in one shell having an inlet and an outlet.

**[0055]** In the embodiment of the present invention, the shell further includes therein a flow channel located in the shell between the inlet and the outlet.

**[0056]** In the embodiment of the present invention, the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99 %-10%.

**[0057]** One embodiment of the present invention provides a low specific resistance substance treatment device, including:

- a conductive electrode capable of conducting electrons to the low specific resistance substance;
- when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;
- an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance;
- and at least one through-hole being provided on the conductive electrode.

**[0058]** In the embodiment of the present invention, when the low specific resistance substance passes through the through-hole on the conductive electrode, the low specific resistance substance passes through the conductive electrode to charge the low specific resistance substance.

**[0059]** In the embodiment of the present invention, a shell having an inlet and an outlet is also included, the conductive electrode and the adsorption electrode being mounted in the shell.

**[0060]** In the embodiment of the present invention, the shell further includes therein a flow channel located in the shell between the inlet and the outlet.

**[0061]** In the embodiment of the present invention, the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99 % -10 %.

**[0062]** One embodiment of the present invention provides a low specific resistance substance treatment method, including steps as follows:

- the low specific resistance substance enters a flow channel from an inlet and moves to an outlet direction; electrons are conducted to the low specific resistance substance by using a conductive electrode to charge the low specific resistance substance;
- the charged low specific resistance substance is attracted by using an adsorption electrode such that the charged low specific resistance substance moves to the adsorption electrode;
- and the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99 % -10 %.

**[0063]** In the embodiment of the present invention, the step of conducting electrons to the low specific resistance substance using a conductive electrode includes steps as follows: electrons are transferred between the low specific resistance substances located between the conductive electrode and the adsorption electrode such that more low specific resistance substances are charged.

**[0064]** In the embodiment of the present invention, electrons are conducted between the conductive electrode and the adsorption electrode through the low specific resistance substance, and an electric current is formed to discharge the current for the conductive electrode.

**[0065]** In the embodiment of the present invention, the step of conducting electrons to the low specific resistance substance by using a conductive electrode includes: the conductive electrode charging the low specific resistance substance by contacting the low specific resistance substance.

**[0066]** In the embodiment of the present invention, the conductive electrode and the adsorption electrode are both

mounted in one shell having an inlet and an outlet.

**[0067]** In the embodiment of the present invention, the flow channel is located in the shell between the inlet and the outlet.

**[0068]** One embodiment of the present invention provides a low specific resistance substance treatment device, including:

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an inlet, an outlet, and a flow channel located between the inlet and the outlet;

a conductive electrode located in the flow channel and capable of conducting electrons to the low specific resistance substance; when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;

10 an adsorption electrode located in the flow channel and capable of exerting attractive force to the charged low specific resistance substance;

and the ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel being 99%-10%.

15 **[0069]** In some embodiments of the present invention, in conducting electrons to the low specific resistance substance with a conductive electrode, "conducting" means that when the conductive electrode is in contact with the uncharged low specific resistance substance, electrons on the conductive electrode are descended to the low specific resistance substance such that the low specific resistance substance carries the same charge as that of the conductive electrode, the charged low specific resistance substance transfers the charge to other uncharged low specific resistance substances, and more low specific resistance substances are charged.

20 **[0070]** The following certain specific embodiments illustrate the implementation of the present invention. Those skilled in the art can easily understand other advantages and efficacies of the present invention from the content disclosed in the description.

25 **[0071]** It should be noted that the structure, proportion, size, etc. shown in the drawings of the description are only used to match the content disclosed in the description for people skilled in the art to understand and read, and are not intended to limit defined conditions of the implementation of the present invention, and thus have no technically substantial meaning. Any structural modification, proportional relationship change or size adjustment should still fall within the scope covered by the technical content disclosed in the present invention without affecting the effects that can be generated and objects that can be achieved by the present invention. At the same time, terms such as "upper", "lower", "left", "right", "middle", and "one" cited in the description are only for the convenience of description and are not used to limit the implementation scope of the present invention. The change or adjustment of the relative relationship shall be deemed as the implementation scope of the present invention without substantial changes to the technical content.

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#### The First Embodiment

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**[0072]** As shown in Figs. 1 to 3, the embodiment provides a low specific resistance substance treatment method, including:

a conductive electrode 301 capable of conducting electrons to low specific resistance substance;

40 when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;

and an adsorption electrode 302 capable of exerting attractive force to the charged low specific resistance substance.

45 **[0073]** Meanwhile, as shown in Fig. 1, the low specific resistance substance treatment device in the embodiment further includes a shell 303 having an inlet 3031 and an outlet 3032, both the conductive electrode 301 and the adsorption electrode 302 being mounted in the shell 303. The conductive electrode 301 is fixedly connected to the inner wall of the shell 303 through an insulating member 304, and the adsorption electrode 302 is directly and fixedly connected to the shell 303. The insulating member 304 in the embodiment is columnar, also referred to as an insulating column. In another embodiment, the insulating member 304 may also be tower-shaped and the like. The present insulating member 304 is primarily anti-pollution and anticreep. In the embodiment, both the conductive electrode 301 and the adsorption electrode 302 are mesh-shaped (i.e., both the conductive electrode and the adsorption electrode are provided with several through-holes), and both are between the inlet 3031 and the outlet 3032. The conductive electrode 301 has a negative potential and the adsorption electrode 302 has a positive potential. Meanwhile, in the embodiment, the shell 303 has the same potential as that of the adsorption electrode 302, and the shell 303 also has an adsorption effect on the charged substance.

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55 **[0074]** The embodiment also provides a low specific resistance substance treatment method for treating industrial tail

gas containing acid mist (the industrial tail gas in the embodiment is the exhaust gas of an engine), including the following steps: conducting electrons to acid mist in industrial tail gas by using the conductive electrode 301 to charge the acid mist; the charged acid mist being attracted by the adsorption electrode 302, causing the charged acid mist to move to the adsorption electrode 302. Specifically, in the embodiment, the inlet 3031 communicates with a port discharging industrial tail gas. As shown in Fig. 1, the working procedure and working principle are as follows: the industrial tail gas flows into the shell 303 through the inlet 3031 and flows out through the outlet 3032; in the procedure, the industrial tail gas flows through the conductive electrode 301, when the acid mist in the industrial tail gas is in contact with the conductive electrode 301 or the distance from the acid mist in the industrial tail gas to the conductive electrode 301 reaches a certain value, the conductive electrode 301 transfers electrons to the acid mist, the acid mist is charged, the adsorption electrode 302 exerts attractive force to the charged acid mist, and the acid mist moves to the adsorption electrode 302 and is attached thereto; because the acid mist has the characteristics of being easy to get charged and easily losing power, a certain charged fogdrop loses power in the procedure of moving to the adsorption electrode 302, and at the moment, other charged fogdrops quickly transfer electrons to the power lost fogdrop, and as this being repeated, the fogdrop is in a continuously charged state, the adsorption electrode 302 can continuously exert adsorption force to the fogdrop, and the fogdrop is attached to the adsorption electrode 302 such that the acid mist in the industrial tail gas is removed, and the acid mist is prevented from being directly discharged into the atmosphere and polluting the atmosphere.

**[0075]** The treatment method and treatment device provided by the embodiment have the following parameters as shown in Table 1:

Table 1

1	The voltage between the conductive electrode and the adsorption electrode, i.e., the power-on driving voltage	12KV
2	Conductive electrode discharge current	0.01A
3	Onset corona inception voltage	5.5KV
4	The ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel	70%
5	Distance between the conductive electrode and the adsorption electrode	10mm

**[0076]** In the embodiment, the conductive electrode 301 and the adsorption electrode 302 constitute an adsorption unit. In addition, under the condition of only one adsorption unit, the low specific resistance substance treatment device and treatment method in the embodiment can remove 80% of acid mist in the industrial tail gas, greatly reducing the discharge amount of the acid mist, and having a remarkable environmental protection effect.

**[0077]** As shown in Fig. 2, three first connecting portions 3011 are provided on the conductive electrode 301 in the embodiment, and the three first connecting portions 3011 are respectively fixedly connected to three second connecting portions which are on the inner wall of the shell 303 through three insulating members 304 such that the connecting mode can effectively enhance the connecting strength between the conductive electrode 301 and the shell 303. In the embodiment, the first connecting portion 3011 has a cylindrical shape, and in other embodiments, the first connecting portion 3011 may have a tower shape and the like. In the embodiment, the insulating member 304 has a cylindrical shape, and in other embodiments, the insulating member 304 may also have a tower shape and the like. The second connecting portion is cylindrical in this embodiment, and in other embodiments the insulating member 304 may also be tower-shaped and the like. As shown in Fig. 1, in the embodiment the shell 303 includes a first barrel body portion 3033, a second barrel body portion 3034, and a third barrel body portion 3035 sequentially distributed from the inlet 3031 to the outlet 3032. The inlet 3031 is located at one end of the first barrel body portion 3033, and the outlet 3032 is located at one end of the third barrel body portion 3035. The profile size of the first barrel body portion 3033 gradually increases from the inlet 3031 to the outlet 3032, and the profile size of the third barrel body portion 3035 gradually decreases from the inlet 3031 to the outlet 3032. The second barrel body portion 3034 is rectangular in cross-section in the embodiment. In the embodiment, the shell 303 adopts the structure design such that the tail gas reaches a certain inlet flow rate at the inlet 3031, and more importantly, the airflow distribution can be made more uniform such that the medium, such as fogdrops, in the tail gas can be charged more easily under the excitation effect of the conductive electrode 301. Meanwhile, it is more convenient for the shell 303 to package, the material consumption is reduced, the space is saved, the connection can be realized by a tube, and it is also beneficial to insulating consideration. Any shell 303 that achieves the above effects is acceptable.

**[0078]** In the embodiment, both the inlet 3031 and the outlet 3032 are circular, and the inlet 3031 may also be referred to as an air inlet, and the outlet 3032 may also be referred to as an air outlet. The diameter of the inlet 3031 in the embodiment is 300mm-1000mm, specifically 500mm. Meanwhile, the diameter of the outlet 3032 in the embodiment is

300mm-1000mm, specifically 500mm.

The Second Embodiment

5 **[0079]** As shown in Figs. 4 and 5, the embodiment provides a low specific resistance substance treatment device, including:

- 10 a conductive electrode 301 capable of conducting electrons to low specific resistance substance;
- when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;
- 15 and an adsorption electrode 302 capable of exerting attractive force to the charged low specific resistance substance.

**[0080]** As shown in Figs. 4 and 5, there are two conductive electrodes 301 in the embodiment, both of which are mesh-shaped and spherical-cage-shaped. In the embodiment, there is one adsorption electrode 302, and the adsorption electrode 302 is mesh-shaped and spherical-cage-shaped. The adsorption electrode 302 is located between two conductive electrodes 301. Meanwhile, as shown in Fig. 4, the low specific resistance substance treatment device in the embodiment further includes a shell 303 having an inlet 3031 and an outlet 3032, both the conductive electrode 301 and the adsorption electrode 302 being mounted in the shell 303. The conductive electrode 301 is fixedly connected to the inner wall of the shell 303 through an insulating member 304, and the adsorption electrode 302 is directly and fixedly connected to the shell 303. The insulating member 304 in the embodiment is columnar, also referred to as an insulating column. In the embodiment, the conductive electrode 301 has a negative potential and the adsorption electrode 302 has a positive potential. Meanwhile, in the embodiment, the shell 303 has the same potential as that of the adsorption electrode 302, and the shell 303 also has an adsorption effect on the charged substance.

**[0081]** The embodiment also provides a treatment method adopting the low specific resistance substance treatment device, which is used for treating industrial tail gas containing acid mist, including the following steps: conducting electrons to acid mist in industrial tail gas by using the conductive electrode 301 to charge the acid mist; and the charged acid mist being attracted by the adsorption electrode 302, causing the charged acid mist to move to the adsorption electrode 302. Specifically, in the embodiment, the inlet 3031 communicates with a port discharging industrial tail gas. As shown in Fig. 4, the working procedure and working principle are as follows: the industrial tail gas flows into the shell 303 through the inlet 3031 and flows out through the outlet 3032; in the procedure, the industrial tail gas flows through one of the conductive electrodes 301, when the acid mist in the industrial tail gas is in contact with the conductive electrode 301 or the distance from the acid mist in the industrial tail gas to the conductive electrode 301 reaches a certain value, the conductive electrode 301 transfers electrons to the acid mist, partial acid mist is charged, the adsorption electrode 302 exerts attractive force to the charged acid mist, and the acid mist moves to the adsorption electrode 302 and is attached thereto; another partial acid mist is not adsorbed to the adsorption electrode 302 and the partial acid mist continues to flow to the outlet 3032, when the partial acid mist is in contact with another conductive electrode 301 or the distance from the partial acid mist to another conductive electrode 301 reaches a certain value, the partial acid mist is charged, and the shell 303 exerts adsorption force to the partially charged acid mist such that the partially charged acid mist is attached to the inner wall of the shell 303, thereby greatly reducing the discharge amount of the acid mist in the industrial tail gas, and the treatment device and the treatment method in the embodiment can remove 90% of the acid mist in the industrial tail gas, and the effect of removing the acid mist is very remarkable. In addition, both the inlet 3031 and the outlet 3032 are circular in the embodiment, and the inlet 3031 may also be referred to as an air inlet and the outlet 3032 may also be referred to as an air outlet.

**[0082]** The treatment method and treatment device provided by the embodiment have the following parameters as shown in Table 2:

Table 2

1	The voltage between the conductive electrode and the adsorption electrode, i.e., the power-on driving voltage	5KV
2	Conductive electrode discharge current	0.005A
3	Onset corona inception voltage	5.5KV
4	The ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel	75%
5	Distance between the conductive electrode and the adsorption electrode	10mm

The Third Embodiment

**[0083]** The embodiment provides a low specific resistance substance treatment device, including:

- 5 a conductive electrode capable of conducting electrons to the low specific resistance substance;  
when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;
- and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

10 **[0084]** In the embodiment, the conductive electrode is mesh-shaped, and the conductive electrode has a negative potential. Meanwhile, in the embodiment, the adsorption electrode is faced, and the adsorption electrode has a positive potential, which is also referred to as an electron collector. In the embodiment, the adsorption electrode is planar, and the conductive electrode is parallel to the adsorption electrode. A mesh surface electric field is formed between the conductive electrode and the adsorption electrode in the embodiment. In addition, in the embodiment, the conductive electrode is a mesh-shaped structure made of metal wires, and the conductive electrode is constituted of wire mesh. In the embodiment, the area of the adsorption electrode is larger than that of the conductive electrode.

The Fourth Embodiment

20 **[0085]** The embodiment provides a low specific resistance substance treatment device, including:

- a conductive electrode capable of conducting electrons to the low specific resistance substance;  
when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;
- 25 and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

30 **[0086]** In the embodiment, the conductive electrode is mesh-shaped, and the conductive electrode has a negative potential. Meanwhile, in the embodiment, the adsorption electrode is barrel-shaped, and the adsorption electrode has a positive potential, which is also referred to as an electron collector. In the embodiment, the conductive electrode is fixed via a metal wire or metal needle. In the embodiment, the conductive electrode is located at the geometric symcenter of the barrel-shaped adsorption electrode. In the embodiment, a mesh barrel electric field is formed between the conductive electrode and the adsorption electrode.

The Fifth Embodiment

35 **[0087]** The embodiment provides a low specific resistance substance treatment device, including:

- a conductive electrode capable of conducting electrons to the low specific resistance substance;  
when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;
- 40 and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

45 **[0088]** In the embodiment, there are two adsorption electrodes, the conductive electrode is located between two adsorption electrodes, the length of the conductive electrode in the left-right direction is larger than that of the adsorption electrode in the left-right direction, and the left end of the conductive electrode is located on the left of the adsorption electrode. The left end of the conductive electrode and the left end of the adsorption electrode form a power line extending along an oblique direction. An asymmetric electric field is formed between the conductive electrode and the adsorption electrode in the embodiment. In use, the low specific resistance substance, such as a fogdrop, enters between the two adsorption electrodes from the left. After getting charged, part of the fogdrops moves to the left end of the adsorption electrode from the left end of the conductive electrode along an oblique direction such that the fogdrops are pulled.

The Sixth Embodiment

55 **[0089]** The embodiment provides a low specific resistance substance treatment device, including:

- a conductive electrode capable of conducting electrons to the low specific resistance substance;  
when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;

and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

5 [0090] In the embodiment, the conductive electrode and the adsorption electrode constitute an adsorption unit. In the embodiment, there are multiple adsorption units, and all the adsorption units are distributed in the transverse direction. In the embodiment, all the adsorption units are specifically distributed in the left-right direction.

The Seventh Embodiment

10 [0091] The embodiment provides a low specific resistance substance treatment device, including:

a conductive electrode capable of conducting electrons to the low specific resistance substance;  
when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;  
15 and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

[0092] In the embodiment, the conductive electrode and the adsorption electrode constitute an adsorption unit. In the embodiment, there are multiple adsorption units, and all the adsorption units are distributed in the longitudinal direction.

20 The Eighth Embodiment

[0093] The embodiment provides a low specific resistance substance treatment device, including:

a conductive electrode capable of conducting electrons to the low specific resistance substance;  
when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;  
25 and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

30 [0094] In the embodiment, the conductive electrode and the adsorption electrode constitute an adsorption unit. In the embodiment, there are multiple adsorption units, and all the adsorption units are distributed in the oblique direction.

The Ninth Embodiment

[0095] The embodiment provides a low specific resistance substance treatment device, including:

35 a conductive electrode capable of conducting electrons to the low specific resistance substance;  
when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;  
and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

40 [0096] In the embodiment, the conductive electrode and the adsorption electrode constitute an adsorption unit. In the embodiment, there are multiple adsorption units, and all the adsorption units are distributed in a spiral direction.

The Tenth Embodiment

45 [0097] The embodiment provides a low specific resistance substance treatment device, including:

a conductive electrode capable of conducting electrons to the low specific resistance substance;  
when electrons are conducted to the low specific resistance substance, the low specific resistance substance being charged;  
50 and an adsorption electrode capable of exerting attractive force to the charged low specific resistance substance.

[0098] In the embodiment, the conductive electrode and the adsorption electrode constitute an adsorption unit. In the embodiment, there are multiple adsorption units, and all the adsorption units are distributed in the transverse direction, longitudinal direction, and oblique direction.

55 The Eleventh Embodiment

[0099] The embodiment provides an engine-based gas treatment system including a low specific resistance substance

treatment device and a venturi plate. The low specific resistance substance treatment device and the venturi plate are used in combination in the embodiment.

The Twelfth Embodiment

5 [0100] The embodiment provides an engine-based gas treatment system including the low specific resistance substance treatment device, the venturi plate, a NO<sub>x</sub> oxidation catalytic device, and an ozone digestion device. In the embodiment, the low specific resistance substance treatment device and the venturi plate are located between the NO<sub>x</sub> oxidation catalytic device and the ozone digestion device. The NO<sub>x</sub> oxidation catalytic device has therein a NO<sub>x</sub> oxidation catalyst, and the ozone digestion device has therein an ozone digestion catalyst.

The Thirteenth Embodiment

15 [0101] The embodiment provides an engine-based gas treatment system including the low specific resistance substance treatment device, a corona device, and a venturi plate, the low specific resistance substance treatment device being located between the corona device and the venturi plate.

The Fourteenth Embodiment

20 [0102] The embodiment provides an engine-based gas treatment system including the low specific resistance substance treatment device, a heating device, and an ozone digestion device, the heating device being located between the low specific resistance substance treatment device and the ozone digestion device.

The Fifteenth Embodiment

25 [0103] The embodiment provides an engine-based gas treatment system including the low specific resistance substance treatment device, a centrifugal device, and a venturi plate, the low specific resistance substance treatment device being located between the centrifugal device and the venturi plate.

The Sixteenth Embodiment

30 [0104] The embodiment provides an engine-based gas treatment system including the low specific resistance substance treatment device, a corona device, a venturi plate, and a molecular sieve, the venturi plate and the low specific resistance substance treatment device being located between the corona device and the molecular sieve.

The Seventeenth Embodiment

35 [0105] The embodiment provides an engine-based gas treatment system including the low specific resistance substance treatment device, a corona device, and an electromagnetic device, the low specific resistance substance treatment device being located between the corona device and the electromagnetic device.

The Eighteenth Embodiment

40 [0106] The embodiment provides an engine-based gas treatment system including the low specific resistance substance treatment device, a corona device, and an irradiation device, the irradiation device being located between the corona device and the low specific resistance substance treatment device.

The Nineteenth Embodiment

50 [0107] The embodiment provides an engine-based gas treatment system including the low specific resistance substance treatment device, a corona device, and a wet electric dust collector, the wet electric dust collector being located between the corona device and the low specific resistance substance treatment device.

The Twentieth Embodiment

55 [0108] As shown in Fig. 6, the embodiment provides an engine-based gas treatment system including an intake device, and Fig. 1 is a schematic view showing the structure of an intake device. The intake device 101 includes an air inlet 1011, a separating mechanism 1012, a first water filtering mechanism 1013, an electrostatic dust removing mechanism

1014, an insulating mechanism 1015, a uniform wind mechanism, a second water filtering mechanism 1017, and/or an ozone mechanism 1018. The first water filtering mechanism 1013 in the embodiment is a low specific resistance substance treatment device provided by the present invention.

5 **[0109]** As shown in Fig. 6, the air inlet 1011 is arranged on an intake wall of the separating mechanism 1012 to receive gas with particulate matter.

**[0110]** The electrostatic dust removing mechanism 1014 includes an anode dirt retention portion 10141 and a first cathode discharging portion 10142 arranged in the anode dirt retention portion 10141, and an asymmetric electrostatic field is formed between the anode dirt retention portion 10141 and the cathode discharging portion 10142.

10 **[0111]** The first water filtering mechanism 1013 arranged in the separating mechanism 1012 includes a conductive plate arranged at the air inlet 1011, and the conductive plate is one conductive mesh plate used for conducting electrons to the low specific resistance substance after being powered-on. The adsorption electrode for adsorbing the charged low specific resistance substance is the anode dirt retention portion 10141 of the electrostatic dust removing mechanism 1014 in the embodiment.

15 **[0112]** Referring to Fig. 7, there is shown a schematic structural view of another embodiment of a first water filtering mechanism arranged in the intake device. Conductive electrode 10131 of the first water filtering mechanism is arranged at the air inlet, and the conductive electrode 10131 is one conductive mesh plate with negative potential. Meanwhile, an adsorption electrode 10132, which is also referred to as an electron collector, is arranged in the intake device in a surface mesh shape, and carries positive potential. In the embodiment, the adsorption electrode 10132 specifically has a planar mesh shape, and the conductive electrode 10131 is parallel to the adsorption electrode 10132. A mesh surface electric field is formed between the conductive electrode 10131 and the adsorption electrode 10132 in the embodiment. 20 In addition, the conductive electrode 10131 is a mesh-shaped structure made of metal wires, and the conductive electrode 10131 is constituted of wire mesh. The area of the adsorption electrode 10132 is larger than that of the conductive electrode 10131.

25 **[0113]** The engine-based gas treatment system further includes a tail gas treatment device. The tail gas treatment device includes a third water filtering mechanism, and the first water filtering mechanism in the embodiment is also suitable for the third water filtering mechanism of the tail gas treatment device of the engine-based gas treatment system.

#### The Twenty-first Embodiment

30 **[0114]** A tail gas treatment system for a diesel engine, as shown in Fig. 8, includes: a nitrogen oxide ( $\text{NO}_x$ ) removing device used for removing nitrogen oxide ( $\text{NO}_x$ ) in the tail gas of the diesel engine; the nitrogen oxide ( $\text{NO}_x$ ) removing device including: an ozone source such as an ozone generator 201 for supplying ozone; a reaction field 202 for mixing and reacting diesel engine tail gas with ozone; a denitration device 203 for removing nitric acid in the tail gas of the diesel engine treated by the nitrogen oxide ( $\text{NO}_x$ ) removing device; the denitration device 203 35 including an electrocoagulation demisting unit 2031, which is a low specific resistance substance treatment device, for electrocoagulation of engine tail gas after ozone treatment, with water mist containing nitric acid being stacked on an adsorption electrode in the low specific resistance substance treatment device. The denitration device 203 further includes a denitration liquid collecting unit 2032 used for storing the nitric acid aqueous solution and/or the nitrate aqueous solution removed from the waste gas; the ozone digester 204 is used for digesting the ozone in the diesel engine tail gas treated 40 by the denitration device. The ozone digester can carry out ozone digestion by the manner of ultraviolet rays, catalysis, and the like.

**[0115]** In the embodiment, the low specific resistance substance treatment device, namely the electrocoagulation demisting unit 2031, includes: a conductive electrode 301 capable of conducting electrons to the low specific resistance substance; when electrons are conducted to the low specific resistance substance, the low specific resistance substance 45 being charged; and an adsorption electrode 302 capable of exerting attractive force to a charged low specific resistance substance.

**[0116]** There are two conductive electrodes 301 in the embodiment, both of which are mesh-shaped and spherical-cage-shaped. In the embodiment, there is one adsorption electrode 302, and the adsorption electrode 302 is mesh-shaped and spherical-cage-shaped. The adsorption electrode 302 is located between two conductive electrodes 301. 50 Meanwhile, as shown in Fig. 4, the low specific resistance substance treatment device in the embodiment further includes a shell 303 having an inlet 3031 and an outlet 3032, both the conductive electrode 301 and the adsorption electrode 302 being mounted in the shell 303. The conductive electrode 301 is fixedly connected to the inner wall of the shell 303 through an insulating member 304, and the adsorption electrode 302 is directly and fixedly connected to the shell 303. The insulating member 304 in the embodiment is columnar, also referred to as an insulating column. In the embodiment, 55 the conductive electrode 301 has a negative potential and the adsorption electrode 302 has a positive potential. Meanwhile, in the embodiment, the shell 303 has the same potential as that of the adsorption electrode 302, and the shell 303 also has an adsorption effect on the charged substance.

**[0117]** The embodiment also provides a treatment method adopting the low specific resistance substance treatment

device, which is used for treating industrial tail gas containing acid mist, including the following steps: conducting electrons to acid mist in industrial tail gas by using the conductive electrode 301 to charge the acid mist; and the charged acid mist being attracted by the adsorption electrode 302, causing the charged acid mist to move to the adsorption electrode 302. Specifically, in the embodiment, the inlet 3031 communicates with a port discharging industrial tail gas. The working procedure and working principle are as follows: the industrial tail gas flows into the shell 303 through the inlet 3031 and flows out through the outlet 3032; in the procedure, the industrial tail gas flows through one of the conductive electrodes 301, when the acid mist in the industrial tail gas is in contact with the conductive electrode 301 or the distance from the acid mist in the industrial tail gas to the conductive electrode 301 reaches a certain value, the conductive electrode 301 transfers electrons to the acid mist, partial acid mist is charged, the adsorption electrode 302 exerts attractive force to the charged acid mist, and the acid mist moves to the adsorption electrode 302 and is attached thereto; another partial acid mist is not adsorbed to the adsorption electrode 302 and the partial acid mist continues to flow to the outlet 3032, when the partial acid mist is in contact with another conductive electrode 301 or the distance from the partial acid mist to another conductive electrode 301 reaches a certain value, the partial acid mist is charged, and the shell 303 exerts adsorption force to the partially charged acid mist such that the partially charged acid mist is attached to the inner wall of the shell 303, thereby greatly reducing the discharge amount of the acid mist in the industrial tail gas, and the treatment device and the treatment method in the embodiment can remove 90% of the acid mist in the industrial tail gas, and the effect of removing the acid mist is very remarkable. In addition, both the inlet 3031 and the outlet 3032 are circular in the embodiment, and the inlet 3031 may also be referred to as an air inlet and the outlet 3032 may also be referred to as an air outlet.

[0118] The treatment method and treatment device provided by the embodiment have the following parameters as shown in Table 3:

Table 3

1	The voltage between the conductive electrode and the adsorption electrode, i.e., the power-on driving voltage	12KV
2	Conductive electrode discharge current	0.018A
3	Onset corona inception voltage	6.5KV
4	The ratio of the cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel	90%
5	Distance between the conductive electrode and the adsorption electrode	10mm

[0119] In summary, the present invention effectively overcomes various disadvantages of the prior art and has high industrial utilization value.

[0120] The above-mentioned embodiments only exemplarily illustrate the principles and efficacies of the present invention, and are not intended to limit the present invention. Modifications or variations to the embodiments mentioned above will occur to those skilled in the art without departing from the spirit or scope of the present invention. Therefore, all equivalent modifications or variations made by those with ordinary knowledge in the technical field without departing from the spirit and technical ideas disclosed by the present invention should still be covered by the claims of the present invention.

**Claims**

1. A low specific resistance substance treatment method, comprising steps of:

conducting electrons to a low specific resistance substance by using a conductive electrode to charge the low specific resistance substance;  
and attracting charged low specific resistance substance by using an adsorption electrode such that the charged low specific resistance substance moves to the adsorption electrode.

2. The low specific resistance substance treatment method according to claim 1, **characterized in that** a step of conducting electrons to the low specific resistance substance by using a conductive electrode comprises: enabling electrons to be transferred between low specific resistance substances located between the conductive electrode and the adsorption electrode such that more low specific resistance substances are charged.

3. The low specific resistance substance treatment method according to claim 1 or 2, **characterized in that** electrons are conducted between the conductive electrode and the adsorption electrode through the low specific resistance substance, and an electric current is formed.
- 5 4. The low specific resistance substance treatment method according to claims 1-3, **characterized in that** the step of conducting electrons to the low specific resistance substance by using a conductive electrode comprises: the conductive electrode charging the low specific resistance substance by contacting the low specific resistance substance.
- 10 5. The low specific resistance substance treatment method according to any one of claims 1-4, **characterized in that** the conductive electrode is provided with at least one through-hole.
- 15 6. The low specific resistance substance treatment method according to claim 5, **characterized in that** the step of conducting electrons to the low specific resistance substance by using a conductive electrode comprises: enabling the low specific resistance substance to pass through the through-hole of the conductive electrode to charge the low specific resistance substance.
- 20 7. The low specific resistance substance treatment method according to any one of claims 1-6, **characterized in that** both the conductive electrode and the adsorption electrode are mounted in one shell having an inlet and an outlet.
- 25 8. The low specific resistance substance treatment method according to any one of claims 1-7, **characterized in that** the shell further comprises therein a flow channel, the flow channel being located in the shell between the inlet and the outlet.
- 30 9. The low specific resistance substance treatment method according to any one of claims 1-8, **characterized by** comprising steps of:  
the low specific resistance substance entering the flow channel from the inlet and moving to an outlet direction;  
when the low specific resistance substance passes through the conductive electrode, the conductive electrode  
conducting electrons to the low specific resistance substance,  
and the low specific resistance substance being charged.
- 35 10. The low specific resistance substance treatment method according to any one of claims 1-9, **characterized in that** a ratio of a cross-sectional area of the conductive electrode to the cross-sectional area of the flow channel is 99%-10%.
- 40 11. A low specific resistance substance treatment device, comprising:  
a conductive electrode capable of conducting electrons to the low specific resistance substance;  
and when electrons are conducted to the low specific resistance substance, the low specific resistance substance  
being charged;  
and an adsorption electrode capable of exerting attractive force to charged low specific resistance substance.
- 45 12. The low specific resistance substance treatment device according to claim 11, **characterized in that** the conductive electrode is provided with at least one through-hole.
- 50 13. The low specific resistance substance treatment device according to claim 11 or 12, **characterized in that** the low specific resistance substance is charged when the low specific resistance substance passes through a through-hole on the conductive electrode.
- 55 14. The low specific resistance substance treatment device according to any one of claims 11-13, **characterized by** further comprising a shell having an inlet and an outlet, wherein the conductive electrode and the adsorption electrode are both mounted in the shell.
15. The low specific resistance substance treatment device according to any one of claims 11-14, **characterized in that** the shell further comprises therein a flow channel, the flow channel being located in the shell between the inlet and the outlet.
16. The low specific resistance substance treatment device according to any one of claims 11-15, **characterized in that** a ratio of a cross-sectional area of the conductive electrode to a cross-sectional area of the flow channel is 99%-10%.



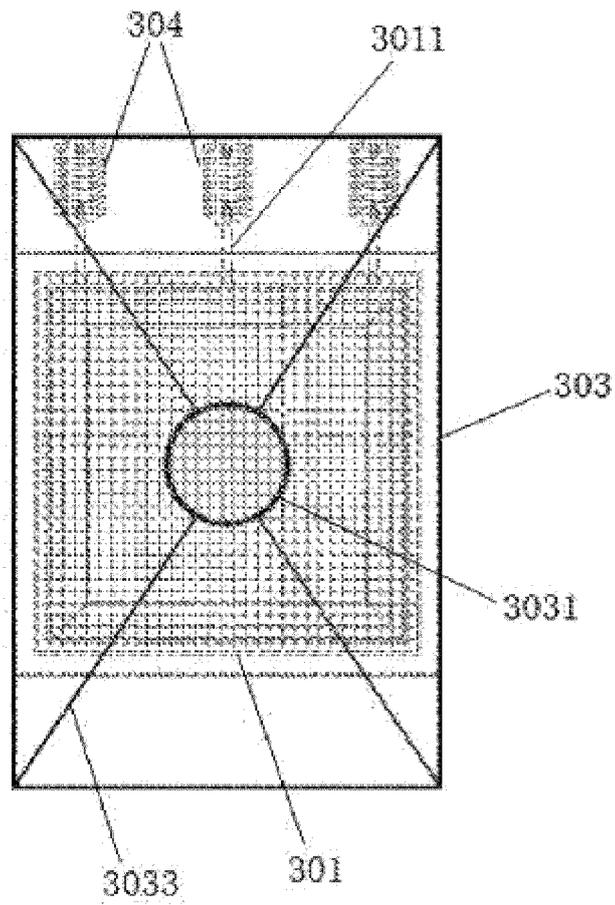


Fig. 2

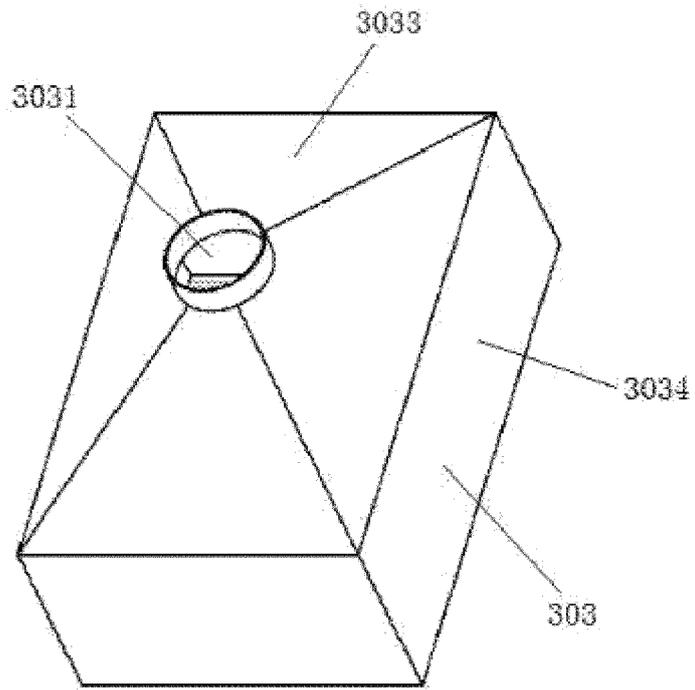


Fig. 3

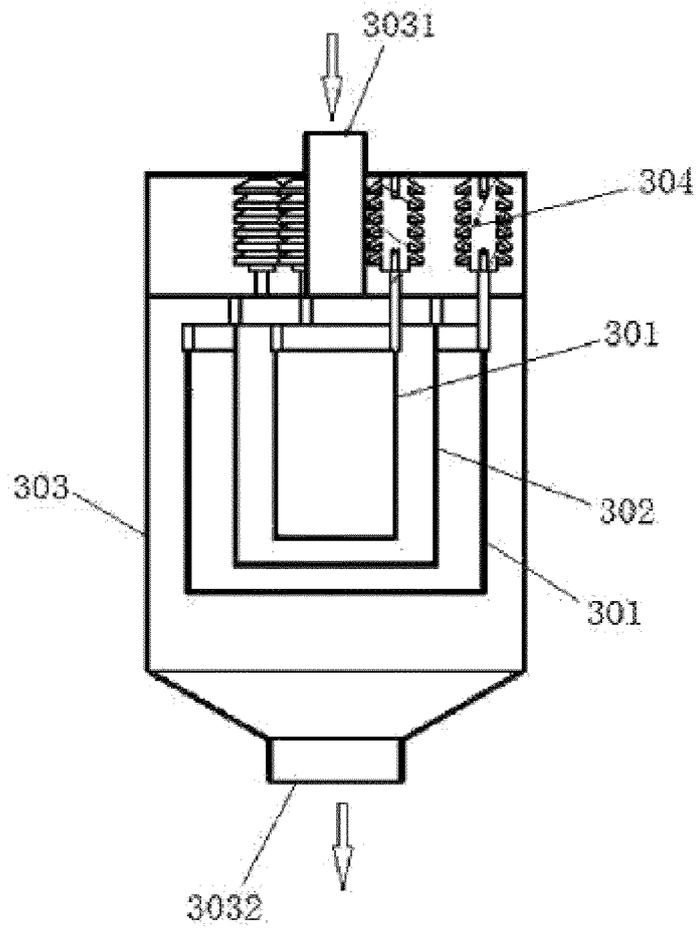


Fig. 4

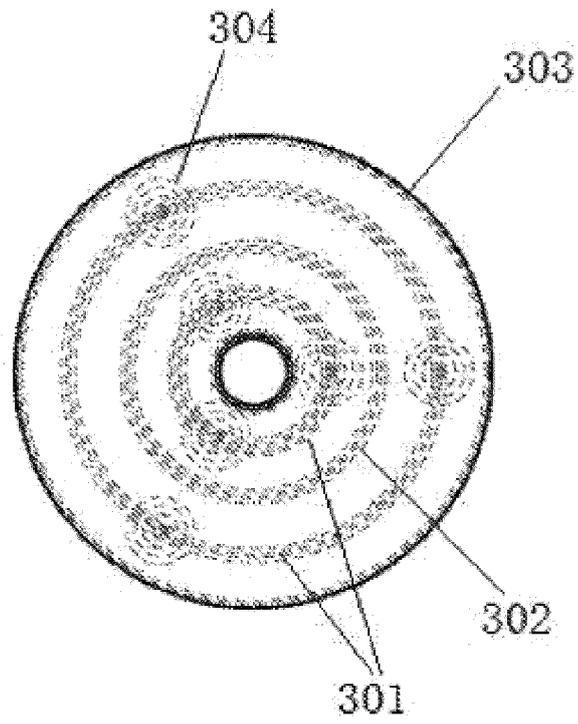


Fig. 5

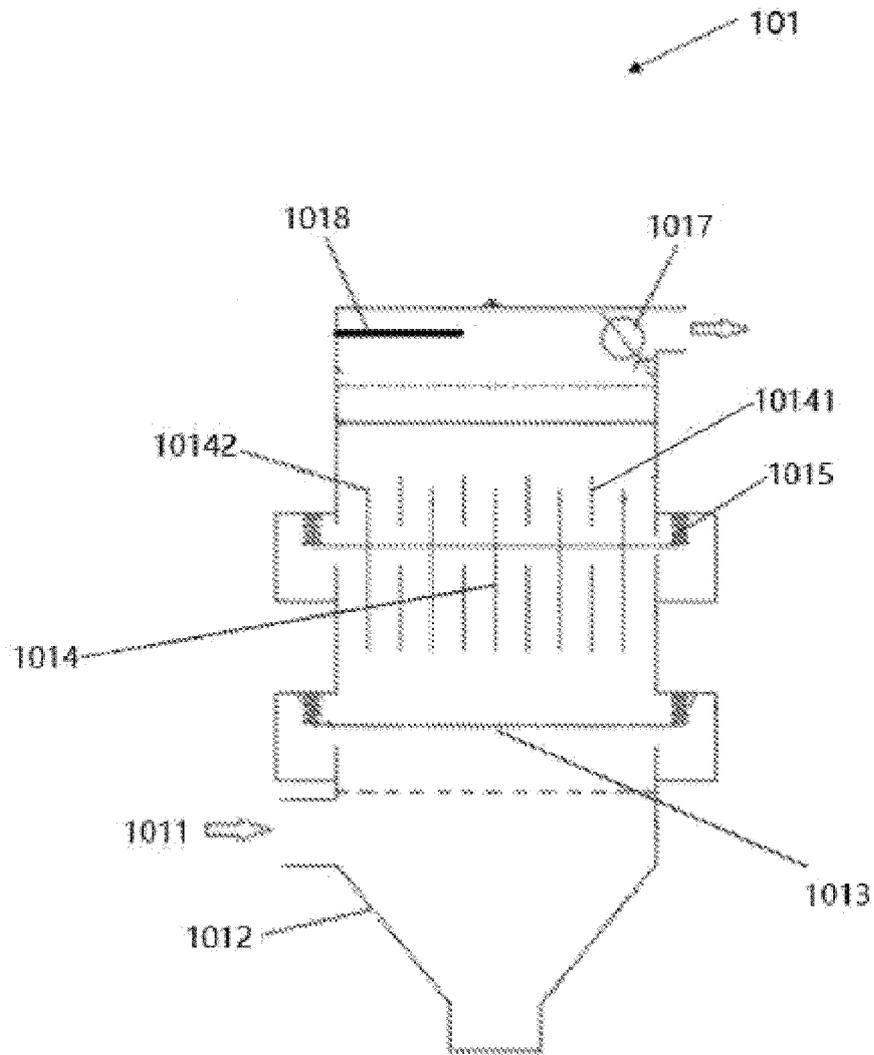


Fig. 6

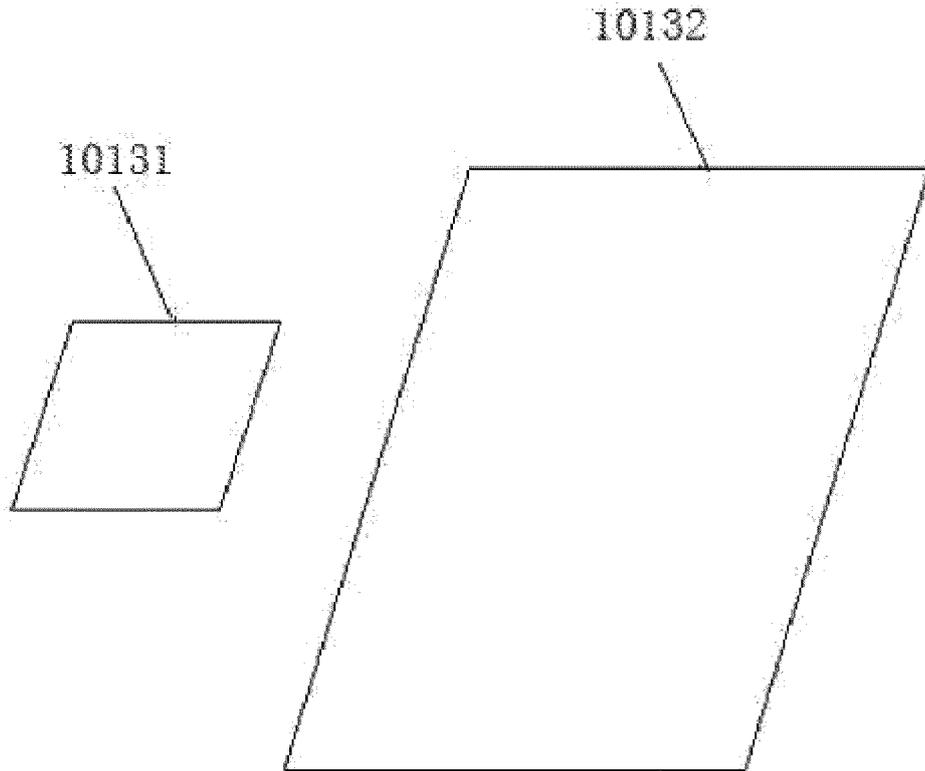


Fig. 7

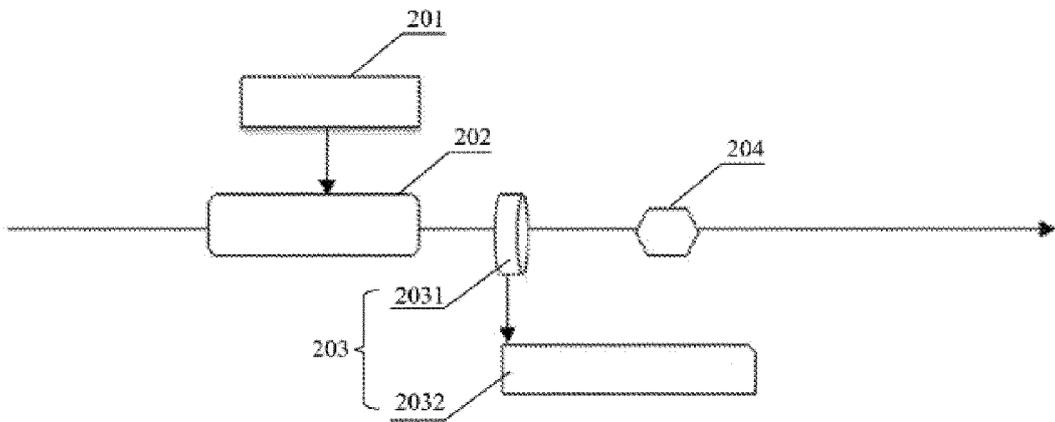


Fig. 8

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/080276

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**A. CLASSIFICATION OF SUBJECT MATTER**

B03C 3/04(2006.01)i; B03C 3/45(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

B03C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

15

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT, CNKI, WPI, EPODOC; 上海必修福企业管理有限公司, 唐万福, 王大祥, 段志军, 奚勇, 低电阻率, 低比电阻, 低电阻系数, 水雾, 尘, 集尘, 电极, 吸附, 空气净化, low s resistivity, water w smoke, dust, catch+, collect+, accumulat+, electrode? air w purifier

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 1970162 A (CHEN, Jianbo) 30 May 2007 (2007-05-30) claims 1-9, description, page 1, line 4 to the end of the chapter, figures 1-4	1-16
A	CN 103357504 A (WANG, Yingpeng) 23 October 2013 (2013-10-23) entire document	1-16
A	CN 102671763 A (LAIWU IRON AND STEEL GROUP CO., LTD.) 19 September 2012 (2012-09-19) entire document	1-16
A	CN 106238207 A (HENAN LONGCHENG COAL EFFICIENT TECHNOLOGY APPLICATION CO., LTD.) 21 December 2016 (2016-12-21) entire document	1-16
A	CN 102794232 A (WU, Fujii) 28 November 2012 (2012-11-28) entire document	1-16
A	CN 104437872 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 25 March 2015 (2015-03-25) entire document	1-16

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 Further documents are listed in the continuation of Box C.
  See patent family annex.

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\* Special categories of cited documents:

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&amp;" document member of the same patent family

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Date of the actual completion of the international search

15 May 2020

Date of mailing of the international search report

27 May 2020

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Name and mailing address of the ISA/CN

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CN)  
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100088  
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INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/CN2020/080276**

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005160907 A1 (3M INNOVATIVE PROPERTIES COMPANY) 28 July 2005 (2005-07-28) entire document	1-16

