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(54) **Process for producing extinguishing agent**

Verfahren zur Herstellung eines Feuerlöschmittels

Procédé pour la préparation d'un agent extincteur

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DescriptionBACKGROUND OF THE INVENTION5 FIELD OF THE INVENTION

[0001] The present invention relates to a process for producing an extinguishing agent for fire.

10 DESCRIPTION OF RELATED ARTS

[0002] An extinguishing agent is made up of various composition. For example, Japanese Patent Laid-Open Publication No. 2001-37901 discloses an extinguishing agent comprising urea, sodium chloride, sodium carbonic anhydride, ammonium sulfate and the like.

[0003] However, amongst processes for producing an extinguishing agent, many of them do not disclose the detail of production as know-how of venders. A process for producing a distinguishing agent will be disclosed herein.

[0004] In recent years, in addition to a floor type fire extinguisher, a throwing type fire extinguisher have been commercialized, which is thrown to the origin of a fire. Since it is sometimes difficult to use the floor type fire extinguisher in the course of the actual action of extinguishing a fire, a throwing type fire extinguisher, which can extinguish a fire only by throwing it at the origin of a fire, may be considered to have easiness and convenience of application.

[0005] However, all of components making up the fire extinguishing agent are not necessarily safe, and there is a possibility to cause a problem when a child or an aged people drinks it by mistake.

[0006] Accordingly, there is a need for a process for producing a safe extinguishing agent, which has no or little adverse influence on human body.

[0007] Furthermore, there is a need for providing a process for producing a safe extinguishing agent, which effectively conducts a treatment so that components incorporated therein may exhibit their action, to thereby produce an extinguishing agent having a high fire-extinguishing performance.

[0008] GB-A-2 257 042 discloses fire extinguishing substances containing a saturated solution of sodium bicarbonate in water.

30 SUMMARY OF THE INVENTION

[0009] According to the present invention, there is provided a process for producing an extinguishing agent comprising process for producing an extinguishing agent comprising

a step of incorporating sodium chloride in an amount of 5 to 15g and ammonium dihydrogenphosphate in an amount of 50 to 70g both relative to 500 ml of water into hot water at a temperature of 30 to 40 degreeC to solve them into the hot water, and

a step of incorporating sodium hydrogen carbonate in an amount of 50 to 70g relative to 500 ml of water into the solution to be dissolved therein.

[0010] The process of the invention may further comprises a step of incorporating a surfactant.

[0011] According to another aspect of the present invention, there is provided a process for producing an extinguishing agent comprising

a step of incorporating sodium chloride in an amount of 5 to 15g and ammonium dihydrogenphosphate in an amount of 50 to 70g both relative to 500 ml of water into hot water at a temperature of 30 to 40 degreeC to solve them into the hot water,

a step of incorporating sodium hydrogen carbonate in an amount of 45 to 70g relative to 500 ml of water into the solution to be dissolved therein,

a step of incorporating urea in an amount of 20 to 40 g relative to 500 ml of water into the solution to be dissolved therein, and a step of incorporating ammonium sulfate in an amount of 35 to 55g relative to 500 ml of water to be dissolved therein.

[0012] The process according to another aspect of the invention may further comprise a step of incorporating a surfactant.

50 DESCRIPTION OF THE PREFERRED EMBODIMENTS

(First Embodiment)

[0013] First embodiment of the present invention will now be described.

[0014] First, 5 to 15 g, e.g., 10g of sodium chloride is incorporated in an appropriate amount of water at a temperature ranging from 30 to 40 degreeC, for example, approximately, 40degreeC, and then the mixture is stirred to dissolve sodium chloride into water. Sodium chloride is utilized as a catalyst.

[0015] Subsequently, 50 to 70g, for example, 60 g of ammonium dihydrogenphosphate is incorporated and dissolved therein, and 50 to 70g, for example, 60 g of ammonium hydrogen carbonate is incorporated to cause a reaction to be dissolved.

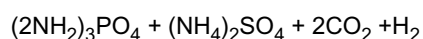
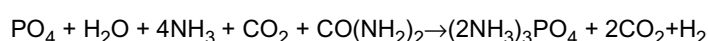
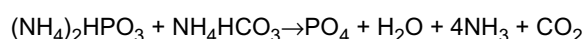
[0016] Ammonium dihydrogenphosphate and ammonium hydrogen carbonate are thermally decomposed into carbon dioxide gas (CO₂) and ammonia gas (NH₃) during the course of fire extinguishing through combustion. Carbon dioxide gas has a function of shielding the supply of oxygen to burning products and a function of neutralizing and suppressing oxidation of burning products. Ammonia gas, which possesses a neutralization function and a cooling function, prevents re-ignition of burning products to avoid spreading fire to circumferences.

[0017] Subsequently, an appropriate amount of boiling water is added to the solution.

[0018] Next, water is added to total amount of extinguishing agent to be 500 ml.

[0019] Finally, as occasion may demand, effective amount, e.g., approximately 20 ml of a surfactant (e.g., alpha foam: surfactant for forming aqueous membrane foam, available from Yamato Protec K.K.) is added to 500 ml of the extinguishing agent.

[0020] Reactions brought about by combustion in the course of extinguishing fire are as follows:



[0021] The extinguishing agent thus produced is incorporated into a container to be ready for use. The container in which the extinguishing agent of the present invention is incorporated may be various kind of containers which can store the extinguishing agent of the present invention without deterioration of quality of the extinguishing agent of the present invention in a stable manner and which are not collided with the extinguishing agent of the present invention. Examples of the containers which can be used, include but are not restricted to metal-made containers, resin-made containers having a light weight.

(Second Embodiment)

[0022] Next, a second embodiment of the present invention will be described.

[0023] First, 5 to 15g, for example, 10g of sodium chloride is incorporated in an appropriate amount of water at 30degreeC, and then the mixture is stirred to dissolve sodium chloride into water. Sodium chloride is utilized as a catalyst.

[0024] Subsequently, 50 to 70 g, for example, 50 g of ammonium dihydrogenphosphate is incorporated and dissolved therein, and 45 to 70 g, for example, 45 g of ammonium hydrogen carbonate is incorporated to cause a reaction to be dissolved.

[0025] Subsequently, boiling water is added to the resulting solution.

[0026] Ammonium dihydrogenphosphate and ammonium hydrogen carbonate are thermally decomposed into carbon dioxide gas and ammonia gas during the course of fire extinguishing through combustion. Carbon dioxide gas has function of shutting the supply of oxygen to burning products and neutralizing and suppressing oxidation of burning products. Ammonia gas, which possesses a neutralization function and a cooling function, prevents reignition of burning products to avoid spreading fire to circumferences.

[0027] Subsequently, 20 to 40 g, for example, 20g of urea is incorporated and dissolved in the solution. Thereafter, 35 to 55g, for example, 45g of ammonium sulfate and an appropriate amount of boiling water are incorporated to dissolve ammonium sulfate.

[0028] Next, water is added to total amount of extinguishing agent to be 500 ml.

[0029] Urea is also thermally decomposed into carbon dioxide gas and ammonia gas by combustion in the course of extinguishing a fire. Due to a function of oxygen-shielding to the burning products possessed by carbon dioxide gas and functions of neutralization and cooling possessed by ammonia gas, burning products can be extinguished and spreading of fire to circumferences can be prevented.

[0030] Finally, as occasion may demand, 20 ml of a surfactant (e. g. , alpha foam) is added to 500 ml of the extinguishing agent..

[0031] The extinguishing agent thus produced is incorporated in a container to be ready for use. The container in which the extinguishing agent of the present invention is incorporated may be various kind of containers which can store the extinguishing agent of the present invention without deterioration of quality of the extinguishing agent of the present invention in a stable manner and which are not collided with the extinguishing agent of the present invention. Examples of the containers which can be used, include but are not restricted to metal-made containers, resin-made containers having a light weight.

[0032] According to the first and second embodiments of the process for producing an extinguishing agent of the present invention, a safety extinguishing agent having no or little influence upon human body can be provided. The use of ammonium hydrogen sulfate increases extinguishing rate.

[0033] The extinguishing rate when the conventional ammonium carbonate is used and that when ammonium hydrogen carbonate is used are shown below.

Table 1

	Rate
Ammonium carbonate	45 seconds
Ammonium hydrogen carbonate	25 seconds

[0034] When being incorporated into an appropriate container, the extinguishing agent produced according to the present invention can be used for a fire extinguisher which is thrown at the origin of a fire when fire occurs. A safety extinguishing agent having no or little influence upon human body can be provided. The use of ammonium hydrogen sulfate increases extinguishing rate.

Claims

1. A process for producing an extinguishing agent comprising
a step of incorporating sodium chloride in an amount of 5 to 15g and ammonium dihydrogenphosphate in an amount of 50 to 70g both relative to 500 ml of water into hot water at a temperature of 30 to 40 degreeC to solve them into the hot water, and
a step of incorporating sodium hydrogen carbonate in an amount of 50 to 70g relative to 500 ml of water into the solution to be dissolved therein.
2. The process according to Claim 1, which further comprises a step of incorporating an effective amount of a surfactant.
3. The process according to Claim 2, wherein said surfactant contains a fluorine-type surfactant for forming an aqueous membrane foam.
4. The process according to Claim 1, wherein said extinguishing agent is incorporated in a container to be ready for use as a throwing type fire extinguisher.
5. The process according to claim 1, wherein after all of the components are dissolved in hot water, water is added to the final volume.
6. The process according to claim 1, which further comprises
a step of incorporating urea in an amount of 20 to 40 g relative to 500 ml of water into the solution to be dissolved therein, and
a step of incorporating ammonium sulfate in an amount of 35 to 55g relative to 500 ml of water to be dissolved therein.
7. The process according to Claim 6, which further comprises a step of incorporating a surfactant.
8. The process according to Claim 7, wherein said surfactant contains a fluorine-type surfactant for forming an aqueous membrane foam.
9. The process according to Claim 6, wherein said extinguishing agent is incorporated in a container to be ready for use as a throwing type fire extinguisher.
10. The process according to claim 7, wherein an appropriate amount of boiling water is added to the solution, before urea is incorporated in the solution.

Patentansprüche

1. Verfahren zum Herstellen eines Löschmittels, welches eine Stufe, in der Natriumchlorid in einer Menge von 5 bis

15 g und Ammoniumdihydrogenphosphat in einer Menge von 50 bis 70 g, jeweils bezogen auf 500 ml Wasser, in heißes Wasser bei einer Temperatur von 30 bis 40°C gegeben werden, um sie in dem heißen Wasser zu lösen, und eine Stufe umfasst, in der Natriumhydrogencarbonat in einer Menge von 50 bis 70 g, bezogen auf 500 ml Wasser, in die Lösung gegeben wird, um es darin aufzulösen.

2. Verfahren nach Anspruch 1, welches außerdem eine Stufe umfasst, in der eine wirksame Menge eines oberflächenaktiven Mittels zugegeben wird.
3. Verfahren nach Anspruch 2, wobei das oberflächenaktive Mittel ein oberflächenaktives Mittel vom Fluortyp zum Bilden eines wässrigen Membranschaums enthält.
4. Verfahren nach Anspruch 1, wobei das Löschmittel in einen Behälter gegeben wird, so dass es für die Verwendung als Feuerlöscher vom Wurftyp bereit ist.
5. Verfahren nach Anspruch, wobei nach Auflösen aller Komponenten in heißem Wasser bis zu dem Endvolumen Wasser zugegeben wird.
6. Verfahren nach Anspruch 1, welches außerdem eine Stufe, in der Harnstoff in einer Menge von 20 bis 40 g, bezogen auf 500 ml Wasser, in die Lösung gegeben wird, um darin aufgelöst zu werden, und eine Stufe umfasst, in der Ammoniumsulfat in einer Menge von 35 bis 55 g, bezogen auf 500 ml Wasser, zugegeben wird, um darin aufgelöst zu werden.
7. Verfahren nach Anspruch 6, welches außerdem eine Stufe umfasst, in der ein oberflächenaktives Mittel zugegeben wird.
8. Verfahren nach Anspruch 7, wobei das oberflächenaktive Mittel ein oberflächenaktives Mittel vom Fluortyp zum Bilden eines wässrigen Membranschaums enthält.
9. Verfahren nach Anspruch 6, wobei das Löschmittel in einen Behälter gegeben wird, um für die Verwendung als Feuerlöscher vom Wurftyp bereit zu sein.
10. Verfahren nach Anspruch 7, wobei eine geeignete Menge kochenden Wassers zu der Lösung gegeben wird, bevor Harnstoff in die Lösung gegeben wird.

Revendications

1. Procédé de production d'un agent d'extinction comprenant :

une étape consistant à incorporer du chlorure de sodium dans une quantité de 5 à 15 g et du dihydrogénophosphate d'ammonium dans une quantité de 50 à 70 g tous deux par rapport à 500 ml d'eau dans de l'eau chaude à une température de 30 à 40°C pour les dissoudre dans l'eau chaude, et
une étape consistant à incorporer de l'hydrogencarbonate de sodium dans une quantité de 50 à 70 g par rapport à 500 ml d'eau dans la solution pour le dissoudre dans celle-ci.

2. Procédé selon la revendication 1, lequel comprend de plus une étape consistant à incorporer une quantité effective d'un tensioactif.
3. Procédé selon la revendication 2, dans lequel ledit tensioactif contient un tensioactif de type fluor pour former une mousse de membrane aqueuse.
4. Procédé selon la revendication 1, dans lequel ledit agent d'extinction est incorporé dans un récipient pour être prêt à l'utilisation comme agent d'extinction de feu de type jet.
5. Procédé selon la revendication 1, dans lequel, après que tous les constituants sont dissous dans de l'eau chaude, de l'eau est ajoutée au volume final.
6. Procédé selon la revendication 1 qui comprend de plus

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une étape consistant à incorporer de l'urée dans une quantité de 20 à 40 g par rapport à 500 ml d'eau dans la solution pour la dissoudre dans celle-ci, et
une étape consistant à incorporer du sulfate d'ammonium dans une quantité de 35 à 55 g par rapport à 500 ml d'eau pour la dissoudre dans celle-ci.

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7. Procédé selon la revendication 6, lequel comprend de plus une étape consistant à incorporer un tensioactif.

8. Procédé selon la revendication 7, dans lequel ledit tensioactif contient un tensioactif de type fluor pour former une mousse de membrane aqueuse.

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9. Procédé selon la revendication 6, dans lequel ledit agent d'extinction est incorporé dans un récipient pour être prêt à l'utilisation comme agent d'extinction de feu de type jet.

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10. Procédé selon la revendication 7, dans lequel une quantité appropriée d'eau en ébullition est ajoutée à la solution avant que l'urée est incorporée dans la solution.

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REFERENCES CITED IN THE DESCRIPTION

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