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(54) **Tobacco Filter Containing Magnesium Aluminometasilicate**

Tabakfilter mit Magnesiumaluminiummetallsilikat

Filtre de tabac contenant un aluminométasilicate de magnésium

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Description

Technical Field

[0001] The present invention relates to the use of a tobacco filter for selectively and efficiently eliminating formaldehyde.

Background Arts

[0002] As an adsorbent for filtering a component in a tobacco smoke, a variety of constituent components are proposed. In JP-B 3 895327, equivalent to WO-A2003/056947, and EP 1470761, a cigarette is disclosed that is characterized by containing a tobacco rod and a filter being connected to the tobacco rod and containing compounds of hydrotalcites of 48.3 to 146.7 mg.
GB-A-1 481 680 discloses filters for cigarettes containing a complex magnesium aluminum silicate as an absorbent for removing tar and nicotine from tobacco smoke.

Summary of the Invention

[0003] An object of the present invention is to provide a tobacco filter capable of selectively and efficiently eliminating aldehydes (in particular, formaldehyde) and provide tobacco provided with the tobacco filter.

[0004] The present invention provides the use of magnesium aluminometasilicate having a specific surface area in the range of 100 m^2/g to 300 m^2/g and wherein the pH of a 4% by mass slurry of the magnesium aluminometasilicate is from 8.5 to 10, in a tobacco filter, which comprises the magnesium aluminometasilicate in an amount of 0.5 to 95 % by mass, for selectively absorbing formaldehyde from the mainstream smoke of tobacco.

Brief Description of the Drawings

[0005] Fig. 1 is an illustrative drawing of a testing method for confirming an adsorption effect of formaldehyde.

[0006] In Fig. 1, the numeral reference 1 represents tobacco, 2 represents filter, 3 represents cut surface, 4 represents sealing tape, 5 represents magnesium aluminometasilicate layer, 6 represents glass tube, and 7 represents sealing tape.

Detailed Description of the Invention

[0007] A tobacco filter of the present invention is excellent in a selective adsorption property for aldehydes, in particular for formaldehyde.

[0008] According to the invention, a tobacco filter uses the above magnesium aluminometasilicate in a filter material. As the filter material, filter tow conventionally used in tobacco filters, non-woven fabrics or the like can be used.

[0009] The magnesium aluminometasilicate used in the present invention is a known component used as e.g. an antacid, or a filler.

[0010] Although the particle size of magnesium aluminometasilicate is not limited in particular, the particle size range of 100 μm to 1000 μm is preferred from the perspective of containing magnesium aluminometasilicate in a predetermined ratio in the tobacco filter and enhancing the adsorption effect of aldehydes.

[0011] The specific surface area of the magnesium aluminometasilicate is in the range of 100 m^2/g to 300 m^2/g from the perspective of enhancing the adsorption effect of aldehydes.

[0012] Further, the pH of a 4% by mass slurry of such magnesium aluminometasilicate is in an alkaline region (from 8.5 to 10).

[0013] In addition, the tobacco filter can also contain known various components blended in tobacco filters such as perfumes.

[0014] The ratio of magnesium aluminometasilicate in the tobacco filter is from 0.5% by mass to 95% by mass of magnesium aluminometasilicate, is preferably from 2% by mass to 85% by mass, and is more preferably from 5% by mass to 70% by mass.

[0015] The tobacco filter, wherein the magnesium aluminometasilicate is used according to the present invention preferably has an either embodiment of:

1. (I) the one having a filter divided into two or three or more segments and having a layer containing magnesium aluminometasilicate in one spot or two or more spots between the adjacent segments; or
2. (II) the one containing magnesium aluminometasilicate in a dispersed state in the filter.

[0016] In the embodiment of (I), in a case where the filter includes three or more segments, it is also possible to have

one segment of a layer containing magnesium aluminometasilicate and the rest of layers containing a perfume and the like.

[0017] The tobacco using the magnesium aluminometasilicate according to the present invention is one provided with the tobacco filter mentioned above, which is effective in reducing formaldehyde in the mainstream smoke of tobacco.

Examples

Examples and Comparative Example

[0018] A tobacco filter shown in Fig. 1 (b) was produced in a manner described below to test the adsorption effect for aldehydes.

[0019] A filter of Peace Lights, trade name, (produced by Japan Tobacco, Inc.) was cut at a position 14 mm away from the end portion to separate it into filters 2a and 2b.

[0020] After removing the filter 2a, a glass tube 6 was fitted onto the remaining filter 2b to fill a predetermined amount of magnesium aluminometasilicate 5 (trade name Neusilin; Fuji Chemical Industry Co., Ltd.). The types and properties of magnesium aluminometasilicate used in each Example are shown in Table 1.

[0021] The magnesium aluminometasilicate was treated with sieves having openings (JIS Z8801-1 2006) of 1.0 mm and 0.1 mm, respectively, to obtain that having a particle size of passing through the openings of 1.0 mm, but not passing through the openings of 0.1 mm. The filter was filled with the magnesium aluminometasilicate.

[0022] After that, the filter 2a was fitted into the glass tube 6 so as to sandwich the magnesium aluminometasilicate 5 with the filter 2b.

[0023] After that, resultant item was tightly sealed with a sealing tape 7 so as to completely cover contact surfaces of the glass tube 6 and the filters 2a and 2b to fabricate tobacco for testing. Fig. 1 (a) is tobacco as a control, in which a filter was cut in the same manner as in Fig. 1(b) to make filters 2a and 2b and then they were tightly sealed with a sealing tape 4 so as to completely cover cut surfaces.

[0024] Through the use of the tobacco for testing shown in Figs. 1(a), (b), measurement was carried out in a method described below by using a measuring device shown in Fig. 2 of JP-B 3895327. Results are shown in Table 1.

(Retention Rate of Formaldehyde)

[0025] Through the use of the tobacco for testing (Fig. 1b) and the tobacco as the control (Fig. 1a), smoking was carried out by a constant volume automatic smoking machine of a piston type (RM20/CS manufactured by Borgwaldt KC GmbH) under the conditions of a flow rate of 17.5 ml/second, a smoking time period of 2 seconds/time, and a smoking frequency of 1 time/minute. Formaldehyde in the mainstream smoke was collected in a DNPH (dinitrophenylhydrazine) solution and was derivatized with the DNPH, and then was measured by using a gas chromatograph (G-3000 manufactured by Hitachi, Ltd.) using the UV (ultraviolet) absorbance.

[0026] By defining an amount of formaldehyde collected by using the tobacco as the control as Tf and an amount of formaldehyde collected by using the tobacco for testing of Comparative Example and Examples as Cf, a formaldehyde retention rate was calculated by the following equation.

$$\text{Formaldehyde Retention Rate (\%)} = 100 \times Cf / Tf$$

[0027] A smaller retention rate of formaldehyde shows a more excellent adsorption performance for formaldehyde. Other aldehydes were also evaluated in a method similar to the above.

Table 1

	Type of Magnesium Aluminometasilicate			Content of Magnesium Aluminometasilicate (% by mass)	Residual Ratio of Aldehydes (%)			
	Type	Specific Surface Area (m^2/g)	pH of 4% by mass slurry		Formaldehyde	Acetaldehyde	Propionaldehyde	Crotonaldehyde
Comparative Example 1 (Control)	(Not Used)			0	100	100	100	100
Example 1	Neusilin SG2	110	9.2	33.8	26	90	61	37
Example 2	Neusilin SG2	110	9.2	16.9	34	97	82	71
Comparative Example 2	Neusilin US2	300	7.3	16.6	30	89	81	46

Claims

1. Use of magnesium aluminometasilicate having a specific surface area in the range of 100 m^2/g to 300 m^2/g and wherein the pH of a 4% by mass slurry of the magnesium aluminometasilicate is from 8.5 to 10, in a tobacco filter, which comprises the magnesium aluminometasilicate in an amount of 0.5 to 95 % by mass, for selectively adsorbing formaldehyde from the mainstream smoke of tobacco.

2. The use according to claim 1, wherein the filter has a layer comprising magnesium aluminometasilicate therein.

3. The use according to claim 1, wherein the filter comprises magnesium aluminometasilicate in a dispersed state therein.

Patentansprüche

1. Verwendung von Magnesiumaluminiummetasilicat mit einer spezifischen Oberfläche im Bereich von 100 m^2/g bis 300 m^2/g, und wobei der pH einer 4 Massenprozent-Aufschlämmung des Magnesiumaluminiummetasilicats 8,5 bis 10 beträgt, in einem Tabakfilter, welcher das Magnesiumaluminiummetasilicat in einer Menge von 0,5 bis 95 Massenprozent umfasst, zum selektiven Adsorbieren von Formaldehyd aus dem Hauptstromrauch von Tabak.

2. Verwendung gemäß Anspruch 1, wobei der Filter eine Schicht aufweist, die Magnesiumaluminiummetasilicat darin umfasst.

3. Verwendung gemäß Anspruch 1, wobei der Filter Magnesiumaluminiummetasilicat in einem dispergierten Zustand darin umfasst.

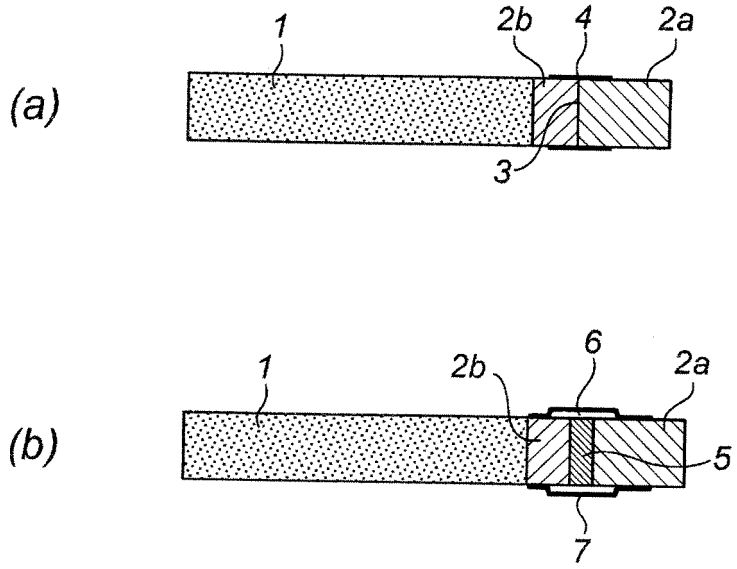
Revendications

1. Utilisation d'un aluminométasilicate de magnésium présentant une surface spécifique située dans la plage de 100 m^2/g à 300 m^2/g et dans laquelle le pH de 4 % en masse de la suspension de l'aluminométasilicate de magnésium est de 8,5 à 10, dans un filtre à tabac, qui comprend l'aluminométasilicate de magnésium en une quantité de 0,5 à 95 % en masse, pour l'adsorption sélectivement de formaldéhyde du flux principal de fumée de tabac.

2. Utilisation selon la revendication 1, dans laquelle le filtre présente une couche comprenant à l'intérieur de l'aluminométasilicate de magnésium.

3. Utilisation selon la revendication 1, dans laquelle le filtre comprend à l'intérieur de l'aluminométasilicate de magnésium sous un état dispersé.

Fig. 1



REFERENCES CITED IN THE DESCRIPTION

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