Material for toilet lid and toilet seat and preparation method thereof
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ABSTRACT
The invention relates to a material for a toilet lid and a toilet seat and a preparation method thereof. The material consists of the following components in parts by weight: 30-75 parts of PA (polyamide), 5-20 parts of PP (polypropylene), 20-50 parts of flame retardant filler, 0.01-2 parts of antibacterial agent and 0.01-2 parts of other assistants. The preparation method comprises the following steps: firstly, placing the flame retardant filler and various assistants into a temperature-controllable high-speed stirrer, and stirring at high speed at the temperature of 90-110 DEG C for 2-10 minutes; then, adding PA and PP resin, and continuously stirring for 2-10 minutes; mixing the mixed components in a single-screw or twin-screw extruder at the temperature which is high enough to keep the selected PA in a molten state to obtain a polymerization product; and finally, extruding the obtained polymer in a stripped way, and then cutting the polymer into segments to form particles. Compared with the prior art, a product made of the material provided by the invention has the advantages of bright surface, scratch resistance, excellent flame retardance and good antibiotic property.

DESCRIPTION translated from Chinese
One for the toilet lid and gasket material and method

Technology
[0001] The invention belongs to the field of polymer materials, relates to a toilet lid and gasket material and method. BACKGROUND

[0002] World Toilet Organization Promoter Mr. Jack that "the scale of human civilization toilet", with the development of human civilization, toileting experience from the field to the interior, from squatting to potty. Toilet, as the 19th century, one of the greatest inventions, had to bring great convenience to people's lives, especially women, pregnant women, obese, elderly infirm. But the toilet lid and gasket on both our naked eyes can not see very small microorganisms. According to the relevant public health authorities survey found that 32% of the toilet seat and toilet gasket on Shigella. Contamination so severe local skin contact with people precisely the most "intimate" and therefore we should focus on clean, often containing hydrochloric acid and water and clean toilet cleaning fluid, and with disinfectant and detergent and other cleaning, will be used over Brush or hard steel balls, etc., thus requiring the toilet lid and gasket material must be water-resistant, corrosion-resistant, scratch-resistant, preferably with antibacterial self-cleaning properties. With computer-controlled intelligent toilet cover development, but also requires the toilet lid with flame retardant properties.

[0003] the toilet lid and gasket materials are generally plastic, urea-formaldehyde resin, wood, bamboo and stone, etc., because the latter three are all resource-based materials, and difficult to maintain, or too heavy, now used less and less. Urea-formaldehyde resin has the advantage of good texture, high hardness, durable, easy to scratch, but urea-formaldehyde resin is a thermosetting material, not recycle, and the case of acid, alkali decomposition, electrical properties and weather resistance is poor.

CLAIMS (10) translated from Chinese
A method for the toilet lid, and the gasket material, characterized in that: the material comprises the following components and parts by weight: polypropylene, polyamide 5-20 30-75 20-50 Flame-retardant filler 0.01-2 other antimicrobial additives 0.01-2.

(2) as claimed in claim 1, wherein the material, characterized in that: said material of 40-67 parts by weight of polyamide; or said polypropylene is 8-15 parts by weight; or said flame retardant filler weight fraction of 25-45; or said antibacterial agent is a weight fraction of 0. 05-1; or said parts by weight of other additives is 0. 02-1.

3 according to claim 1, wherein a material, characterized in that: said polyamide is polyamide 6, polyamide 66, polyamide 610, polyamide 1010, polyamide 1111, polyamide 1212, polyamide 1313 in one or several.

As claimed in claim 3, wherein a material, characterized in that: said polyamide PA6 or PA610.

5 according to claim 1, wherein a material, characterized in that: said polypropylene homopolymer and copolymer type, including, flow rate of 1 ~ 40g/10min.

As claimed in claim 1, wherein a material, characterized in that: the flame-retardant filler comprises Mg (OH) 2, Al (OH) 3 or a mixture of both in any proportion.

As claimed in claim 1, wherein a material, characterized in that: said antimicrobial agent is a silver-based antimicrobial agent.

As claimed in claim 1, wherein a material, characterized in that: said other additives selected from anti-nucleating agent, a lubricant Qi ù,
oxidizing agents, heat stabilizers, UV stabilizers, coupling agents, processing stabilizers, pigments, colorants, or one or more plasticizers.

9 A process according to claim 1, wherein the material, characterized in that: comprising the steps of: (1) the first flame retardant fillers and various additives to be placed in a temperature-controlled high-speed mixer at 90 to 110 °C, high-speed stirring 2 ~ 10 min; (2) PA and PP resin was added and stirring continued 2 ~ 10 min; (3) and the mixed components in the single-screw or twin-screw extruder, PA in the selected the temperature maintained in a molten state were mixed to obtain the polymerization product; (4) of the obtained polymer extruded strips, then cut into sections to form a particle.

A process according to claim 9, wherein the production method is characterized in that: the PA so that the selected temperature is maintained in a molten state the melting point PA is 5 ~ 40 °C; aspect ratio of the extruder 18 to 25, the compression ratio of 2 to 4.

Polypropylene plastic toilet cover commonly used PP (Polypropylene), acrylonitrile - butadiene - styrene copolymer, ABS (Acrylonitrile Butadiene Styrene) and acrylic polymethyl methacrylate PMMA (PolymethylMethacrylate) and so on. Acrylic is the second after the ceramic sanitary ware is better able to manufacture new materials. Acrylic has good toughness, unbreakable, easy to clean and soft texture and other characteristics, but the acrylic plate surface hardness is low, easy to be scratched, and the cold is also poor, brittle transition temperature of about 9.2 °C, and very easy to burn , limited oxygen index is only 17.3. ABS hardness, scratch resistance and is not easily deformed, but easy to change, easy to break, poor anti-aging, high temperature performance is poor, poor corrosion resistance. PP material is not easy to change color, fracture resistance, high temperature resistance, corrosion resistance, water resistance, but the hardness is not enough, difficult to produce. Although there are scratch-resistant PP, but scratch easily liniment precipitation outgoing products taste great.

SUMMARY OF THE INVENTION

[0004] The present invention is to provide a good flame resistance, scratch resistance, antibacterial toilet seat cover and gasket material and preparation method, this material resistant to high temperature and electrical properties are excellent.

[0005] The principle of the present invention, polyamide (PA) is formed by adding an appropriate amount PP PA / PP alloy, PP is added to improve the easy absorption of the PA and imparting good toughness, while maintaining the alloy itself is excellent PA scratch resistance and electrical properties. Adding the flame retardant filler alloy, while the material to be V-2 to the VO flame retardant, the other of these fillers can improve the products scratch resistance. Antimicrobial agent to be added can be significantly improved antibacterial properties of materials to enhance the toilet lid and the self-cleaning ability of the gasket. Inorganic fungicides used mainly in metallic silver, zinc, copper-based raw materials in the inorganic filler is made of the carrier. Copper ions with colors that will affect the appearance, with some antibacterial zinc, but the antibacterial strength of only silver ions 1/1000, so this patent a silver-based antimicrobial agent selected. [0007] The object of the present invention can be achieved through the following technical solutions:

[0008] A method for the toilet lid and gasket material, which comprises the following components and parts by weight:

[0009] Polyamide 30 to 75,
[0010] Polypropylene 5-20,
[0011] flame retardant filler 20 to 50,
[0012] 0.01 to antibacterial agents,
[0013] Other additives 0.01-2.

[0014] wherein the polyamide is polyamide 6, polyamide 66, polyamide 610, polyamide 1010, polyamide 1111, polyamide 1212, polyamide 1313 in one or several.

[0015] Preferably said polyamide PA6 or PA610.

[0016] The polypropylene homopolymer and copolymer type, including, flow rate of 1 ~ 40g/10min.

[0017] The polypropylene of the flow rate is preferably 10 ~ 30g/10min.

[0018] The flame-retardant filler comprises Mg (OH) 2, Al (OH) 3 or a mixture of both in any proportion.

[0019] The antimicrobial agent is an inorganic nano-silver antibacterial agent.

[0020] Other additives selected from the group of the anti-nucleating agents, lubricants, oxidants, thermal stabilizers, UV stabilizers, coupling agents, power port workers stabilizers, pigments, colorants, or a plasticizer one or several.

[0021] for the toilet lid and ring pad material preferably contains the following components and parts by weight:

[0022] Polyamide 40-67
[0023] Polypropylene 8-15
The flame retardant parts by weight of the filler is preferably: 25 ~ 45.

The antibacterial agent by weight is preferably as follows: 0.05-1.

The parts by weight of other additives is preferably as follows: 0.02-1.

A process for the toilet lid and the ring of the pad material, the method comprising steps of:

(1) Flame retardant fillers and various additives to be placed in a temperature-controlled high-speed mixer, at 90 ~ 110 °C under high speed stirring for 2 ~ 10min;

(2) PA and PP resin was added, stirring was continued for 2 ~ 10min;

(3) and the mixed components in the single-screw or twin-screw extruder, PA sufficient to allow the selected temperature is maintained in a molten state were mixed to obtain the polymerization product; enough to make the choice of the PA maintained in a molten state above the melting temperature of PA is 5 ~ 40 °C. The aspect ratio of the extruder is 18 to 25, and the compression ratio of 2 to 4.

(4) of the obtained polymer extruded strips, then cut into sections to form a particle.

The present invention has the beneficial effects:

The present invention Polyamide (PA) is formed by adding an appropriate amount PP PA / PP alloy, PP's easy to join the PA improves water absorption, good toughness and given material, while maintaining the PA alloy itself is excellent scratch rub resistance and electrical properties.

Further, in the alloy flame retardant filler added, one can make the material reaches the V-2 to the VO flame retardant, the other of these fillers can improve the products scratch resistance.

Antibacterial agent added can significantly improve the antibacterial properties of materials to enhance the toilet lid and the self-cleaning ability of the gasket. Specific embodiments

The following specific embodiments with the present invention will be further described. These examples are illustrative only, the scope of the invention without any limitation.

In the following Examples,

PA6 said: Polyamide 6, medium viscosity, commercially available

PA610 said: polyamide 610, low viscosity, commercially available

PPl said: flow rate of 3g/10min homopolymer PP, commercially available

PP2 said: flow rate of 15g/10min copolymer PP, commercially available

Filler 1 means: Mg (OH) 2

Filler 2 represents: A1 (OH) 3

Filler 3 is: Mg (OH) 2 and Al (OH) 3 in 1: 2 mixture

Antimicrobial 1: SHT_120, Hi-Tech Fine Chemical Co., Ltd. Haining. Antimicrobial 2 JDSP-O1, Jinda nanotechnology Limited.

Other additives: Antioxidant 1098 Antioxidant 168, Ciba Specialty Chemicals. Lubricants A-CS40A, Honeywell (Honeywell). (First flame retardant fillers and various additives to be placed in a temperature-controlled high-speed mixer, high speed at 100 °c under stirring 2min, then PA and PP resin added and stirring continued for 3min, and the mixed ingredients in a single -screw or twin-screw extruder used in PA sufficient to maintain the molten state at a temperature obtained by mixing would be to strip the obtained polymer extruded and then cut into sections to form a particle.)
Examples 1-5

The pellets prepared in accordance with the ISO test standard injection into a corresponding spline, and at 23 ± 2 °C, 50 ± 5% relative humidity environment for testing placement M hours.

in accordance with ISO 22196: 2007 standard measurement antibacterial;

according to UL94 vertical burning standard measurement 1.6mm thick spline flame retardant;

measured in accordance with ISO 15184 standard pencil scratch-resistant;

Visual color and appearance. Test results are shown below:

The above description of the embodiments for ease of ordinary skill in the art who can understand and apply the invention. The person skilled in the art readily be apparent that various embodiments of these modifications, and the generic principles described here applied to other embodiments without going through the creative labor. Accordingly, the present invention is not limited to the embodiments herein, the skilled person according to the present invention disclosed, without departing from the scope of the present invention, improvements and modifications made in the present invention should be within the scope of protection.

CLASSIFICATIONS

International Classification | B29C47/92, C08L77/02, C08K3/22, C08L23/12, C08L77/06, C08L23/14, C08K13/02, B29B9/06, C08K3/08, C08L77/00

LEGAL EVENTS

Date | Code | Event | Description
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Oct 31, 2012 | C10 | Request of examination as to substance
May 23, 2012 | C06 | Publication