CLAIMS

1. A modified polypropylene-based cooling tower filler, comprising the following components:
   polypropylene: 100 parts, ethylene-propylene copolymer: 10 parts, polypropylene grafted maleic anhydride: 10 parts, initiator: 0.05-2 Parts, modifier: 2-20 parts, antioxidant: 0.1-2 parts, carbon material: 5-15 parts, fiber: 5-20 parts, filler: 10-30 parts.

2. A modified polypropylene-based cooling tower filler stated in claim 1, comprising a mixture of homopolymer polypropylene and copolymerized polypropylene at a ratio of between 1:3 and 3:1.

3. A modified polypropylene-based cooling tower filler stated in claim 1, comprising modifiers selected from at least one of the following three: methyl allyl polyoxyethylene ether, allyl alcohol polyoxyether or (and) allyl polyoxyethylene ether; comprising the carbon materials selected from at least one of the following: carbon fibers, multi-walled carbon nanotubes, single-arm carbon nanotubes and graphene, after surface modification; comprising the initiator of dicumyl peroxide or benzoyl peroxide.

4. A modified polypropylene-based cooling tower filler stated in claim 3, comprising the methallyl polyoxyethylene or allyl polyoxyethylene ether with a molecular weight of 1,000 to 4,000.

5. A modified polypropylene-based cooling tower filler stated in claim 1, comprising the antioxidant of a mixture of the main antioxidant 1010 and the secondary antioxidant 168, with the mass ratio of 3:1.

6. A modified polypropylene-based cooling tower filler stated in claim 1, comprising the fibers selected from at least one of the following fibers with a length of 2-8 mm.: glass fibers, basalt fibers, boron fibers, ceramic fibers and modified aramid fibers.

7. A modified polypropylene-based cooling tower filler stated in claim 1, comprising the filler of a polypropylene-based calcium carbonate masterbatch, of which 60% is calcium carbonate.

CLAIMS

8. A process to produce the modified polypropylene-based cooling tower filler stated in claim 1, comprising the following steps:
   (1). The raw materials are weighed according to the ratio stated in claim 1.
   (2). The modifier and initiator are dissolved in absolute ethanol to form a solution or a turbid liquid.
   (3). Polypropylene, ethylene propylene copolymer, polypropylene grafted maleic anhydride, antioxidant, carbon materials, fibers and fillers are mixed evenly and then calendered in an open mill.
   (4). After the materials in (3) are completely plasticized, the solution or turbid liquid disposed in (2) is sprayed onto the surface of the plasticized materials by a spray device to carry out a graft reaction;
   Mixing and calendaring of the triangle pack continues for another 5-15 minutes after the spraying is complete to ensure a thorough grafting reaction. The synthetic material of polypropylene-based cooling tower filler can then be obtained.
   (5). The synthetic material in (4) is extruded into a sheet, and then compression-molded to obtain a flat sheet of the polypropylene-based cooling tower filler.

9. A process to produce the modified polypropylene-based cooling tower filler stated in claim 8, comprising step (4) with the grafting reaction at a reaction temperature of 175-210 °C.

10. A process to produce the modified polypropylene-based cooling tower filler stated in claim 8, comprising the duration between the beginning of plasticization and the end of mixing and calendering process being between 20 and 40 minutes.

CLAIMS

1. A modified polypropylene-based cooling tower filler, comprising the following components: polypropylene: 100 parts, ethylene-propylene copolymer: 10 parts, polypropylene grafted maleic anhydride: 10 parts, initiator: 0.05-2 Parts, modifier: 2-20 parts, antioxidant: 0.1-2 parts, carbon material: 5-15 parts, fiber: 5-20 parts, filler: 10-30 parts.

2. A modified polypropylene-based cooling tower filler stated in claim 1, comprising a mixture of homopolymer polypropylene and copolymerized polypropylene at a ratio of between 1:3 and 3:1.

3. A modified polypropylene-based cooling tower filler stated in claim 1, comprising modifiers selected from at least one of the following three: methyl allyl polyoxyethylene ether, allyl alcohol polyoxyether or (and) allyl polyoxyethylene ether; comprising the carbon materials selected from at least one of the following: carbon fibers, multi-walled carbon nanotubes, single-arm carbon nanotubes and graphene, after surface modification; comprising the initiator of dicumyl peroxide or benzoyl peroxide.

4. A modified polypropylene-based cooling tower filler stated in claim 3, comprising the CO methallyl polyoxyethylene or allyl polyoxyethylene ether with a molecular weight of 1,000 to 4,000.

5. A modified polypropylene-based cooling tower filler stated in claim 1, comprising the antioxidant of a mixture of the main antioxidant 1010 and the secondary antioxidant 168, with the mass ratio of 3:1.

6. A modified polypropylene-based cooling tower filler stated in claim 1, comprising the fibers selected from at least one of the following fibers with a length of 2-8 mm.: glass fibers, basalt fibers, boron fibers, ceramic fibers and modified aramid fibers.

7. A modified polypropylene-based cooling tower filler stated in claim 1, comprising the filler of a polypropylene-based calcium carbonate masterbatch, of which 60% is calcium carbonate.

8. A process to produce the modified polypropylene-based cooling tower filler stated in claim 1, comprising the following steps:

1) the raw materials are weighed according to the ratio stated in claim 1;
2) the modifier and initiator are dissolved in absolute ethanol to form a solution or a turbid liquid;
3) polypropylene, ethylene propylene copolymer, polypropylene grafted maleic anhydride, antioxidant, carbon materials, fibers and fillers are mixed evenly and then calendered in an open mill;
4) after the materials in (3) are completely plasticized, the solution or turbid liquid disposed in (2) is sprayed onto the surface of the plasticized materials by a spray device to carry out a graft reaction; mixing and calendaring of the triangle pack continues for another 5-15 minutes after the spraying is complete, to ensure a thorough grafting reaction. the synthetic material of polypropylene-based cooling tower filler can then be obtained;
5) the synthetic material in (4) is extruded into a sheet, and then compression-molded to obtain a flat sheet of the polypropylene-based cooling tower filler.

9. A process to produce the modified polypropylene-based cooling tower filler stated in claim 8, comprising step (4) with the grafting reaction at a reaction temperature of 175-210 ℃.

10. A process to produce the modified polypropylene-based cooling tower filler stated in claim 8, comprising the duration between the beginning of plasticization and the end of mixing and calendering process being between 20 and 40 minutes.