DESCRIPTION

TITLE OF THE INVENTION

HOLLOW POLYESTER LONG FIBER AND PREPARATION METHOD THEREFOR

TECHNICAL FIELD

The present invention relates to a hollow polyester long fiber of hollow crimped shape and a preparation method thereof, and the hollow long fiber is suitable for making long fiberfill.

BACKGROUND ART

In the textile industry, feathers and downs of waterfowls, such as goose down, duck down, etc., are usually filled in duvets, sleeping bags and various cold-proof and warmth retention products. Bird flu that has occurred worldwide has led to a sharp decline in the production of down, which has caused prices to rise. At the same time, consumers also have doubts about the safety of down. If the natural feathers are not adequately washed, it will cause bad odor. Therefore, it is necessary to remove the odor-causing dirt in advance and maintain the cleanliness of the feathers. Moreover, there are still problems in washing feather filling products, such as feather bedding, feather jackets and the like.

To this end, the industry is committed to the use of synthetic fibers instead of animal downs for filling. Chinese patent CN1861871A discloses a short-fiber type of down-like fiberfill, but the short-fiber fiberfill has low fluffiness, and a heat insulating material produced therefrom has a grainy feel when touched, while the short-fiber type down-like fiberfill is prone to shifting when washed. Therefore, there is an urgent need to develop a new type of filling material instead of down. Polyester fiber is easy to produce and has the advantage of low price. The development of polyester-based filling materials has a good market prospect.

SUMMARY

It is an object of the present disclosure to provide a hollow polyester long fiber having a three-dimensionally crimped shape, which is suitable for use in the production of long fiberfill, and a method for preparing the hollow polyester long fiber.

In an aspect, there is provided a hollow polyester long fiber, wherein the long fiber has a cross-sectional hollowness ranging from 20.0% to 45.0%, and the long fiber has a three-dimensionally crimped shape in a natural state, and the crimped shape has a radius of curvature ranging from 10.0 mm to 50.0 mm.

The hollow polyester long fiber of the present disclosure has a cross-sectional

hollowness ranging from 20.0% to 45.0%, and the hollow polyester long fiber has a three-dimensionally crimped shape in a natural state, and the crimped shape has a radius of curvature ranging from 10.0 mm to 50.0 mm.

The hollow polyester long fiber of the present disclosure preferably has a monofilament fineness ranging from 4.0 dtex to 15.0 dtex, and more preferably from 5.0 dtex to 10.0 dtex.

The hollow polyester long fiber of the present disclosure still has a three-dimensionally crimped shape after dry heat treatment at 160°C for 3 minutes, and has a radius of curvature in a crimped state ranging from 3.5 mm to 10.0 mm.

The hollow polyester long fiber of the present disclosure has a polymer raw material selected from the group consisting of polyethylene terephthalate, polytrimethylene terephthalate, polybutylene terephthalate or a modified polymer thereof.

The present disclosure also discloses a method for preparing the above-mentioned hollow polyester long fiber, wherein a dried chip is melt-extruded by a screw and then conveyed to a metering pump through a pipe, the polymer accurately measured by the metering pump is conveyed to a spinning pack, a spinneret of the spinning pack is a hollow spinneret with a cooling distance ranging from 10 to 150 mm, and a wind speed of side blowing ranges from 25 to 90 m/min.

The cooling distance preferably ranges from 60 to 110 mm; and the wind speed of the side blowing ranges from 30 to 50 m/min.

The hollow polyester long fiber of the present disclosure is obtained by a melt spinning process, has the advantages of simple production and low cost, and has a three-dimensional crimped structure, and is suitable for processing into a fluffy processed tow which can be used as long fiberfill.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a view showing a triangular hollow cross-sectional shape of a hollow polyester long fiber.

FIG. 2 is a view showing a quadrangular hollow cross-sectional shape of a hollow polyester long fiber.

FIG. 3 is a view showing a three-dimensionally crimped shape of a hollow polyester long fiber in a natural state.

FIG. 4 is a schematic view showing a measurement of a radius of curvature.

CLAIMS

1. A hollow polyester long fiber, wherein the long fiber has a cross-sectional hollowness ranging from 20.0% to 45.0%, and the long fiber has a three-dimensionally crimped shape in a natural state, and the crimped shape has a radius of curvature ranging from 10.0 mm to 50.0 mm.

2. The hollow polyester long fiber according to claim 1, wherein the long fiber has a monofilament fineness ranging from 4.0 dtex to 15.0 dtex.

3. The hollow polyester long fiber according to claim 2, wherein the long fiber has a monofilament fineness ranging from 5.0 dtex to 10.0 dtex.

4. The hollow polyester long fiber according to claim 1 or 2, wherein the long fiber has a radius of curvature ranging from 3.5 mm to 10.0 mm after dry heat treatment at 160°C for 3 minutes.

5. The hollow polyester long fiber according to claim 1 or 2, wherein the polyester is selected from the group consisting of polyethylene terephthalate, polytrimethylene terephthalate, polybutylene terephthalate or a modified polymer thereof.