Publication No. 2000-327926

DISCLOSURE OF THE INVENTION

Problems to be Solved by the Invention

The present invention has been proposed in view of the foregoing situations, and has an object to provide a water-absorbent resin having better water-absorption performance and being prevented from discoloring before and after storage for a long time under high temperature and high humidity and an absorbent article including the absorbent resin.

Means for Solving the Problems

(1) The present invention provides a water-absorbent resin prepared by polymerizing a water-soluble ethylenically unsaturated monomer in the presence of an internal-crosslinking agent and performing post-crosslinking with a post-crosslinking agent, wherein a monomer of 70 to 100 mol% in the water-soluble ethylenically unsaturated monomer is acrylic acid or salt thereof; the post-crosslinking agent is at least one selected from the group consisting of (poly)ethylene glycol diglycidyl ethers, (poly)glycerin diglycidyl ethers, (poly)glycerin triglycidyl ethers, trimethylolpropane triglycidyl ethers, (poly)propylene glycol polyglycidyl ethers, and (poly)glycerol polyglycidyl ethers; the water-absorbent resin satisfying all of the following properties:

(A) a water-absorption capacity of physiological saline of 55 g/g or more, a water-absorption capacity of physiological saline under a load of 4.14 kPa of 15 mL/g or more, and a residual monomer content of 300 ppm or less; and

(B) a yellow index of 5.0 or less and a yellow index change ratio (ΔYI) after leaving for 10 days under 70°C and 90% RH of 10 or less.

(2) The present invention also provides the water-absorbent resin according to aspect (1), wherein the water-soluble ethylenically unsaturated monomer is at least one

amount of the water-absorbent resin in the container was placed in a glass measurement container having an inner diameter of 3 cm, and the yellow index of the water-absorbent resin was measured with a color difference meter (Color Meter ZE2000, made by Nippon Denshoku Industries Co., Ltd.). The yellow index was calculated from the resulting tristimulus values, X, Y, and Z, of the water-absorbent resin by the following formula. The yellow index was measured for the water-absorbent resins stored for 7 days, for 10 days, for 14 days, and for 21 days in the constant temperature and humidity chamber to examine the discoloration of the water-absorbent resin with passage of time.

Yellow index = 100(1.28X-1.06Z)/Y

The yellow index change ratio (ΔYI) of the water-absorbent resin is calculated as the change ratio in the yellow index after the storage under 70°C and 90% RH for a predetermined number of days by the following formula:

Yellow index change ratio (ΔYI) = [(yellow index after storage for a predetermined number of days) - (yellow index before the storage)]/(yellow index before the storage)

4-2. Examples and Comparative Examples

[Example 1]

A 2-L cylindrical round-bottom separable flask having an inner diameter of 110 mm and equipped with a reflux condenser, a dropping funnel, a nitrogen gas-introducing tube, and stirrer having stirring blades compound of two sets of 4 inclined paddle blades with a blade diameter of 50 mm was

1000 μm to obtain 95.1 g of a spherical water-absorbent resin. The thus-prepared water-absorbent resin was evaluated in accordance with each type of the above-described test methods. The resulting water-absorbent resin had a median particle diameter of 120 μm.

[Example 6]

A 2-L cylindrical round-bottom separable flask having an inner diameter of 110 mm and equipped with a reflux condenser, a dropping funnel, a nitrogen gas-introducing tube, and stirrer having stirring blades compound of two sets of 4 inclined paddle blades with a blade diameter of 50 mm was prepared. Into this flask added were 300 g of n-heptane, 0.74 g of HLB3 sucrose stearic acid ester (made by Mitsubishi-Kagaku Foods Corporation, Ryoto sugar ester S-370) as a surfactant, and 0.74 g of maleic anhydride modified ethylene-propylene copolymer (made by Mitsui Chemicals, Inc., High Wax 1105A) as a polymeric dispersion agent. The mixture was heated to 80°C with stirring to dissolve the surfactant and was then cooled to 50°C.

Meanwhile, 92 g (1.02 mol) of an aqueous 80 mass% acrylic acid solution was put in a 500-mL Erlenmeyer flask, and 146.0 g of an aqueous 21 mass% sodium hydroxide solution was dropwise added thereto while cooling from the outside for neutralization at 75 mol%. Subsequently, 0.092 g of hydroxylethyl cellulose (made by Sumitomo Seika Chemicals Co.,

CLAIMS

1. A water-absorbent resin prepared by polymerizing a water-soluble ethylenically unsaturated monomer in the presence of an internal-crosslinking agent and performing post-crosslinking with a post-crosslinking agent, wherein

a monomer of 70 to 100 mol% in the water-soluble ethylenically unsaturated monomer is acrylic acid or salt thereof;

the post-crosslinking agent is at least one selected from the group consisting of (poly)ethylene glycol diglycidyl ethers, (poly)glycerin diglycidyl ethers, (poly)glycerin triglycidyl ethers, trimethylolpropane triglycidyl ethers, (poly)propylene glycol polyglycidyl ethers, and (poly)glycerol polyglycidyl ethers;

the water-absorbent resin satisfying all of the following properties:

(A) a water-absorption capacity of physiological saline of 55 g/g or more, a water-absorption capacity of physiological saline under a load of 4.14 kPa of 15 mL/g or more, and a residual monomer content of 300 ppm or less; and

(B) a yellow index of 5.0 or less and a yellow index change ratio (ΔYI) after leaving for 10 days under 70°C and 90% RH of 10 or less.

2. The water-absorbent resin according to Claim 1, having a median particle diameter of 100 to 600 μm.

3. A water-absorbent resin prepared by further blending an aminocarboxylic acid compound in the water-absorbent resin

according to Claim 1.

4. The water-absorbent resin according to Claim 3, wherein the aminocarboxylic acid compound is at least one selected from the group consisting of diethylenetriaminepentaacetic acid, triethylenetetraminehexaacetic acid, trans-1,2-diaminocyclohexanetetraacetic acid, ethylenediaminetetraacetic acid, and salts thereof.

5. An absorbent article comprising an absorbent material including the water-absorbent resin according to Claim 1.