azo-based radical initiator is used instead of a persulfate which tends to promote a self-crosslinking (see Patent Document 1).

[0006]

However, when an azo-based compound is used, a large amount of residual monomers tend to exist in the resulting water-absorbent resin since it is difficult to increase the polymerization rate of a water-soluble ethylenically unsaturated monomer.

[0007]

Some methods have been proposed for decreasing a content of residual monomers in a water-absorbent resin. For example, the following methods have been known; a method wherein two times or more of divided additions of a radical polymerization initiator to a monomer liquid are carried out to increase an amount of the initiator (see Patent Document 2); a method wherein a persulfate is added to a water-absorbent resin during or after polymerization (see Patent Document 3); and a method wherein a reducing substance is added to a water-absorbent resin before or during drying (see Patent Document 4); and the like.

PRIOR ART DOCUMENT

Patent Documents

[0008]

Patent Document 1: JP 2006-176570 A

Patent Document 2: JP S63-7203 B

Patent Document 3: JP 2004-517179 A

Patent Document 4: JP H07-98847 B

SUMMARY

[0008a]

In one aspect of the present disclosure, there is provided a process for producing a water-absorbent resin, characterized in that

a reverse-phase suspension polymerization of water-soluble ethylenically unsaturated monomers is carried out in a hydrocarbon dispersion medium comprising a dispersion stabilizer while an azo-based compound and a peroxide are combined in the presence of an internal-crosslinking agent, in that

the water-soluble ethylenically unsaturated monomers are (meth)acrylic acid and the salt thereof, in that

the following formulae are satisfied,

$0.10 \leq B / (A + B)$ (1), and

$0.055 \leq B + 9 \times C \leq 0.120$ (2),

wherein A mol, B mol and C mol represent used amounts of the azo-based compound, the peroxide and the internal-crosslinking agent, respectively, relative to 100 mol of the water-soluble ethylenically unsaturated monomers used in the polymerization, in that

$0.0005 \text{ mol} \leq B \leq 0.10 \text{ mol}$, and in that

a post-crosslinking reaction is carried out by adding a post-crosslinking agent after the polymerization.

[0008b]

In another aspect of the present disclosure, there is provided a water-absorbent resin obtained by polymerizing water-soluble ethylenically unsaturated monomers in the presence of an internal-crosslinking agent, and adding a post-crosslinking agent after the polymerization to carry out a post-crosslinking reaction,

wherein

the water-soluble ethylenically unsaturated monomers are (meth)acrylic acid and the salt thereof, wherein

the used amount of internal-crosslinking agent is from 0.001 to 0.013 mol, relative to 100 mol of the water-soluble ethylenically unsaturated monomers used in the polymerization, and wherein

the water-absorbent resin satisfies all of the following characteristics (A) to (D):

(A) a water-retention capacity of physiological saline of 36 to 60 g/g,

(B) a water-absorption capacity of physiological saline under a load of 4.14 kPa, of 20 to 32 ml/g,

(C) a vertical diffusion water-absorption capacity of 4.0 ml/g or higher, and

(D) a content of residual monomers of 180 ppm or lower.

[0008c]

In a further aspect of the present disclosure, there is provided an absorbent article comprising the water-absorbent resin as described herein.

CLAIMS

[Claim 1]

A process for producing a water-absorbent resin, characterized in that

a reverse-phase suspension polymerization of water-soluble ethylenically unsaturated monomers is carried out in a hydrocarbon dispersion medium comprising a dispersion stabilizer while an azo-based compound and a peroxide are combined in the presence of an internal-crosslinking agent, in that

the water-soluble ethylenically unsaturated monomers are (meth)acrylic acid and the salt thereof, in that

the following formulae are satisfied,

$0.10 \leq B / (A + B)$ (1), and

$0.055 \leq B + 9 \times C \leq 0.120$ (2),

wherein A mol, B mol and C mol represent used amounts of the azo-based compound, the peroxide and the internal-crosslinking agent, respectively, relative to 100 mol of the water-soluble ethylenically unsaturated monomers used in the polymerization, in that

$0.0005 \text{ mol} \leq B \leq 0.10 \text{ mol}$, and in that

a post-crosslinking reaction is carried out by adding a post-crosslinking agent after the polymerization.

[Claim 2]

The process for producing a water-absorbent resin according to claim 1, wherein the azo-based compound is at least one selected from the group consisting of 2,2'-azobis(2-amidinopropane) dihydrochloride, 2,2'-azobis{2-[1-(2-hydroxyethyl)-2-imidazolin-2-yl]propane} dihydrochloride, and

2,2'-azobis[N-(2-carboxyethyl)-2-methylpropionamidine] tetrahydrate.

[Claim 3]

The process for producing a water-absorbent resin according to claim 1, wherein the peroxide is at least one selected from the group consisting of potassium persulfate, ammonium persulfate, sodium persulfate and hydrogen peroxide.

[Claim 4]

The process for producing a water-absorbent resin according to claim 1, wherein the internal-crosslinking agent is at least one selected from the group consisting of (poly)ethylene glycol diglycidyl ether, (poly)propylene glycol diglycidyl ether, (poly)glycerin diglycidyl ether and N,N'-methylenebis(meth)acrylamide.

[Claim 5]

A water-absorbent resin obtained by polymerizing water-soluble ethylenically unsaturated monomers in the presence of an internal-crosslinking agent, and adding a post-crosslinking agent after the polymerization to carry out a post-crosslinking reaction, wherein

the water-soluble ethylenically unsaturated monomers are (meth)acrylic acid and the salt thereof, wherein

the used amount of internal-crosslinking agent is from 0.001 to 0.013 mol, relative to 100 mol of the water-soluble ethylenically unsaturated monomers used in the polymerization, and wherein

the water-absorbent resin satisfies all of the following characteristics (A) to (D):

(A) a water-retention capacity of physiological saline of 36 to 60 g/g,

(B) a water-absorption capacity of physiological saline under a load of 4.14 kPa, of 20 to 32 ml/g,