DESCRIPTION

POLYMERIZATION REACTOR AND METHOD FOR MANUFACTURING~~PRODUCING~~ WATER-~~-~~ABSORBING~~ENT~~ RESIN

[FIELD OF THE INVENTION]

[0001]

The present invention relates to a polymerization reactor for performing polymerization reaction. In particular, the present invention relates to a polymerization reactor configured to allow heat transfer through a wall of a container body due to the flow of a cooling/heating medium. The invention also relates to a method for producing a water absorbent resin by using such a polymerization reactor.

[BACKGROUND ART]

[0002]

Fig. 4 shows a typical polymerization reactor used for producing a polymer such as a water absorbent resin. The illustrated polymerization reactor has a container body 91 for containing e.g. a reaction solution, and an outer shell (jacket 92) that covers the outer surface of the container body 91. A cooling/heating medium (cooling medium or heating medium) is caused to flow through the inside of the jacket 92 as required, so that the content (e.g. reaction solution or reaction mixture) is cooled or heated due to heat transfer through the wall of the container body 91. Thus, the temperature of the content of the container body 91 is controlled to a predetermined temperature. The container body 91 needs to have a certain degree of strength to withstand the load of the content and the pressure during the polymerization process. Thus, the container body 91 is made of a material having excellent strength (e.g. carbon steel plate). Generally, the container body 91 is provided with an agitating element 93 for making the content homogeneous and have a uniform temperature. For instance, a

CLAIMS

1. A polymerization reactor for performing polymerization reaction, comprising:

a container body; ~~and~~

a jacket covering an outer surface of the container body and defining a passage for passing a cooling/heating medium between itself and the outer surface of the container body; and

an inert gas supplier for supplying an inert gas into the passage;

wherein the container body is made of a clad metal plate comprising a support metal layer having an inner surface at an inner side of the container body and an outer surface at an outer side of the container body, and an inner corrosion-resistant metal skin layer bonded to the inner surface of the support metal layer and being smaller in thickness than the support metal layer.

2. The polymerization reactor according to claim 1, wherein the thickness of the inner skin layer is in a range of 1/10 to 1/2 of the thickness of the support metal layer.

3. The polymerization reactor according to claim 1 or 2, wherein the clad metal plate further comprises an outer corrosion-resistant metal skin layer bonded to the outer surface of the support metal layer, the outer skin layer being smaller in thickness than the support metal layer.

4. The polymerization reactor according to claim 3, wherein the support metal layer is made of carbon steel, whereas the inner skin layer and the outer skin layer are made of stainless steel.

5. The polymerization reactor according to claim 3 or 4, wherein the inner skin layer is larger in thickness than the outer skin layer.

6. The polymerization reactor according to any one of claims 1 through 5, wherein the thickness of the support metal layer is 5 to 15 mm.

~~7. The polymerization reactor according to any one of claims 1 through 6, further comprising an inert gas supplier for supplying an inert gas into the passage.~~

~~8~~7. The polymerization reactor according to any one of claims 1 through ~~7~~6, wherein the jacket is internally portioned by a helical partition plate, the passage extending helically along the partition plate.

~~9~~8. The polymerization reactor according to any one of claims 1 through ~~8~~7, the container body has an open upper end that is closed by a lid.

~~10~~9. The polymerization reactor according to claim ~~9~~8, wherein the lid is made of ~~an additional~~a clad metal plate comprising a support metal layer having an inner surface at the inner side of the container body and an outer surface at the outer side of the container body, and an ~~additional~~ inner corrosion-resistant metal skin layer bonded to the inner surface of the ~~additional~~ support metal layer of the lid and being smaller in thickness than the ~~additional~~ support metal layer of the lid.

~~11~~10. The polymerization reactor according to claim ~~10~~9, wherein the ~~additional~~ clad metal plate of the lid further comprises an ~~additional~~ outer corrosion-resistant metal skin layer bonded to the outer surface of the ~~additional~~

support metal layer of the lid, the ~~additional~~ outer skin layer of the lid being smaller in thickness than the ~~additional~~ support metal layer of the lid.

~~12~~11. A method for producing a water absorbent resin by subjecting a water-soluble ethylenically unsaturated monomer to reversed phase suspension polymerization in a petroleum-based hydrocarbon dispersion medium, wherein the polymerization is performed in the container body of the polymerization reactor as set forth in any one of claims 1 through ~~11~~10.