polymerization process has an advantage of being able to produce a polymer composition efficiently since the polymerization is conducted without using a solvent. Practically, the continuous bulk polymerization, however, has various problems compared with the continuous solution polymerization, such as that reaction control is difficult due to high viscosity of a reaction mixture, and when an inner surface of a reactor is cooled to remove heat from a reaction system, this degrades quality of a polymer composition and thus of a resin composition obtained therefrom. Then, a process is proposed which uses a reactor of a complete mixing type, fully fills the reactor with liquid to exclude a gas phase part therefrom, and conducts continuous bulk polymerization under an adiabatic condition with no heat transfer to or from the outside (JP 07-126308 A). Further, in order to assure such adiabatic condition, a continuous bulk polymerization apparatus is proposed which controls a supply amount of a raw material monomer and a supply amount of a polymerization initiator so as to make a temperature in the reactor equal to a setting temperature of an outer surface of the reactor (JP 2006-104282 A).

SUMMARY ~~OF THE INVENTION~~

Technical Problem

In recent years, applications of resin compositions such as methacrylic ester polymers has been expanded furthermore, a demand is increasing for more efficiently producing a polymer composition of high quality (for example, a polymer composition having superior properties such as heat resistance and heat stability, and less immixed with impurities). However, it has been proved that the conventional process for producing a polymer composition (JP 07-126308 A and JP 2006-104282 A) are not always sufficient to meet the demand.

The purpose of the present ~~invention~~ disclosure is to provide a process for producing a polymer composition, which process is able to more efficiently produce the polymer composition with high quality.

Solution to Problem

The inventors considered using at least two reactors of a complete mixing type in combination to conduct continuous polymerization. As to a continuous solution polymerization process, apparatuses having two stages of reactors are known, such as that the most part of polymerization is conducted in the former reactor and the polymerization is completed in the latter reactor while removing a polymerization initiator therefrom (JP 01-172401 A); and that polymerization is conducted to some extent in

the former reactor and a solvent is added to the latter reactor to conduct polymerization (JP 05-331212 A). In processes using such apparatuses, however, removal of heat from a reaction system is conducted by reflux cooling (a raw material monomer or the like in the reactor is evaporated to be taken out of the reactor, and it is returned to the reactor again after subjected to cold condensation), this brings about local or rapid cooling of the reaction system, which causes gel to adhere to and grow on the inner surface of the reactor. Especially in a case of conducting the polymerization in a less amount of solvent or with a high polymerization ratio in order to increasing a productivity, a viscosity of a mixture in the reaction system becomes high, this makes the local or rapid cooling of the reaction system arise more easily, which makes the adhering and growing of the gel on the inner surface of the reactor prominent. As a result, there is a problem such as that gelled substance is immixed into a resultant polymer composition as impurities. The inventors have considered earnestly on a novel process for producing a polymer composition which is able to more efficiently produce the polymer composition with high quality, and finally completed the present ~~invention~~disclosure.

In accordance with one aspect, there is provided a process for producing a methacrylic ester polymer

composition, which comprises a first polymerization step of supplying a raw material monomer and a polymerization initiator to a first reactor of a complete mixing type through its supply port to be subjected to continuous polymerization under an adiabatic condition in the first reactor of the complete mixing type, and taking a resultant intermediate composition from an effluent port located at a top of the first reactor of the complete mixing type; and a second polymerization step of supplying the intermediate composition to a second reactor of a complete mixing type through its supply port to be further subjected to continuous polymerization under an adiabatic condition in the second reactor of the complete mixing type, and taking a resultant polymer methacrylic ester composition from an effluent port located at a top of the second reactor of the complete mixing type; wherein the first polymerization step is conducted at a temperature from 125 to 170°C, and the second polymerization step is conducted at a temperature from 130 to 180°C; and wherein in the first polymerization step and in the second polymerization step, the continuous polymerization is conducted under a fully filled condition.

~~The~~ Example embodiments of the present ~~invention~~ disclosure provide~~s~~ the following [1] to [4].

type to an average residence time in the first reactor of the complete mixing type is from 9/1 to 1/9.

[3] The process for producing the polymer composition according to the above [1], wherein the continuous polymerization in the first polymerization step and the second polymerization step is continuous bulk polymerization.

[4] A molded article prepared from the polymer composition produced by the process according to any of the above [1] to [3].

Advantageous Effects of ~~Invention~~Present Disclosure

According to the present ~~invention~~disclosure, there is provided a novel process for producing a polymer composition which is able to more efficiently produce the polymer composition with high quality, more specifically, a polymer composition having high heat stability.

Brief Description of Drawings

Fig. 1 shows a schematic view for explaining a process for producing a polymer composition in one embodiment of the present invention.

Following reference signs denote the following elements:

1 ··· raw material monomer tank (supply source of raw