Coated articles in particular are ideally smooth and non-tacky, and they preferably have a coating that does not flake off. There is a need in the art for such articles, and methods of making such articles.

[0004] Coatings have been used in products, such as for enhancing the desirable features of rubber gloves. Previous coatings have been developed, such as those disclosed in U.S. Patent Nos. 4,548,844; 4,575,476; 6,242,042; 6,706,313; 7,179415; 6,772,443; 7,032,251; 6,706,836; 6,743,880; 7,019,067; 6,653,427; 6,828,399; 6,284,856; and 5,993,923, each of which is incorporated in its entirety as if set forth fully herein. All references cited herein are incorporated by reference in their entirety.

SUMMARY

[0005] A novel and useful preparation of a copolymer emulsion is provided. In one embodiment, a method for forming a copolymer emulsion is provided by combining and copolymerizing at least one water soluble monomer and at least one water insoluble monomer, wherein the monomers used in the process are comprised of at least 50% by weight water soluble monomer and at least 10% by weight water insoluble monomer as measured by the total monomer weight.

[0005a] In one aspect of the present disclosure, there is provided a method for the preparation of a copolymer emulsion comprising:

combining at least one water soluble monomer and at least one water insoluble monomer to form a monomer mixture, wherein the monomer mixture comprises, as measured as the weight percentage of the total monomer mixture weight, at least 50% water soluble

monomer and at least 10% water insoluble monomer, and copolymerizing the monomer mixture to form a copolymer emulsion.

[0006] In another ~~embodiment~~aspect of the present disclosure, the method for the preparation of a copolymer emulsion is provided that includes concurrently combining a monomer feed and a pre-emulsion feed to form an emulsion, wherein the monomer feed comprises at least 50% by weight water soluble monomer based on the total monomer weight of the monomer feed and the pre-emulsion feed, and the pre-emulsion feed comprises at least 10% by weight

water insoluble monomer based on the total monomer weight of the monomer feed and the pre-emulsion feed.

[0006a] In yet another aspect of the present disclosure, there is provided a method for the preparation of a copolymer emulsion comprising:

concurrently combining a monomer feed and a pre-emulsion feed to form an emulsion, wherein the monomer feed comprises at least 50% by weight water soluble monomer based on the total monomer weight of the monomer feed and the pre-emulsion feed, and the pre-emulsion feed comprises at least 10% by weight water insoluble monomer based on the total monomer weight of the monomer feed and the pre-emulsion feed, wherein the method further comprises the following steps:

introducing into a reactor and agitating an initial charge comprising a stabilizer, a surfactant, an initiator, and deionized water;

maintaining the reactor contents at a temperature of about 55° C and a pH above about 6.0;

introducing about 6% of the monomer feed and about 6% of the pre-emulsion feed into the reactor and maintaining the temperature and pH in the reactor for about ten minutes;

introducing an activator feed into the reactor at a rate such that the contents of the activator feed will be exhausted concurrently with or after the exhaustion of the monomer feed and the pre-emulsion feed, wherein the activator feed comprises deionized water and sodium hydroxymethanesulfinate;

introducing the monomer feed and the pre-emulsion feed into the reactor at a constant rate over a span of about 4.5 hours;

after the monomer feed, pre-emulsion feed, and activator feed have been fully introduced into the reactor, introducing a feed into the reactor comprising a second initiator and

maintaining the temperature and pH in the reactor for about one hour to complete polymerization.

[0006b] In a further aspect of the present disclosure, there is provided a method for the preparation of a copolymer emulsion comprising:

concurrently combining a monomer feed and a pre-emulsion feed to form an emulsion, wherein the monomer feed comprises about 75% by weight water soluble monomer based on the total monomer weight of the monomer feed and the pre-emulsion feed, and the pre-emulsion feed comprises at least about 3% by weight water insoluble monomer based on the total monomer weight of the monomer feed and the pre-emulsion feed.

[0007] In still another embodiment, the method for the preparation of a copolymer emulsion is provided by concurrently combining a monomer feed and a pre-emulsion feed to form a monomer mixture, wherein the monomer feed comprises at least 50% by weight water soluble monomer and wherein the pre-emulsion feed comprises at least 10% water insoluble monomer, with such percentages based on the total monomer weight of the monomer feed and the pre-emulsion feed. The method further requires introducing into a reactor and agitating an initial charge that includes a stabilizer, a surfactant, an initiator, and deionized water and maintaining the reactor contents at about 55° C and at a pH above about 6.0. The method also includes introducing about 6% of the monomer feed and about 6% of the pre-emulsion feed into the reactor and maintaining the temperature and pH for about ten minutes, followed by introducing an activator feed into the reactor. The activator feed, which includes deionized water and sodium hydroxymethanesulfinate, is introduced at a rate such that the contents of the activator feed will be exhausted concurrently with or after the exhaustion of the monomer feed and the pre-emulsion feed. The remaining

monomer feed and pre-emulsion feed are introduced into the reactor at a constant rate to fully feed the remaining contents over a span of about 4.5 hours. Then, after the monomer feed, pre-emulsion feed, and activator feed have been fully introduced into the reactor, a post feed, including a second initiator, is introduced into the reactor and the temperature and pH is maintained for about one hour to complete polymerization.