PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in the Chemical Creaming of Latex

I, THOMAS ADAM CLAYTON, of Byron House, 23, Albemarle Street, London, W.1, a British Subject, do hereby declare the nature of this invention which has been communicated to me by United States Rubber Company, of 1230, Sixth Avenue, New York, 20, United States of America, a corporation organised and existing under the laws of the State of New Jersey, United States of America, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the chemical creaming of latex of the *Hevea brasiliensis* tree, hereinafter called "latex".

It is known to desludge latex by passing the latex through a clarifier type of centrifuge which removes sediment from the latex without concentrating the latex, and thereafter concentrating the latex, by adding an organic colloidal creaming agent, such as a vegetable mucilage. It has also been suggested to add soap to the latex after clarification and before creaming, which is known to accelerate the creaming of fresh latex with creaming agents. The violent agitation of the latex in the clarifier is also known to accelerate the subsequent creaming.

It is desirable to add the creaming agent to the latex before the clarification so that the agitation in the clarifier will effectively mix the creaming agent in the latex, and also in order that any insoluble precipitate that may be formed from the natural polyvalent salts (e.g. calcium and magnesium salts) in the latex and the creaming agent will be thrown out in the clarification process. The addition of the creaming agent to the latex before passing through the clarifier, however, has the disadvantage of producing a final cream of low strainability (see article entitled "Latex Strainability Test" by Brass and Slovin, in "Analytical Chemistry", published by American Chemical Society, Vol. 20, page 172 to 174, February 1948, for reference to strainability test). The clarification of latex in a centrifuge inherently produces a large amount of foam in the discharged desluged latex which on settling or breaking down reverts to a large extent to its original fluid condition. However, there are some undesirable coagulum particles formed when the foam breaks up, (so-called "foam-coagulum") which floats on the latex. Where a creaming agent is added to the latex before the clarification, the amount of foam-coagulum in the clarified latex after settling of the foam is considerably increased, resulting in a lower recovery of rubber in the overall creaming process. Where soap is used to accelerate the creaming of desluged latex, it has previously been considered undesirable to add the soap to the latex before clarification since the soap inherently causes large amounts of foam, and it was believed that this procedure would produce even more foam in the clarified latex which would take a correspondingly longer time to settle down and revert to the fluid state.

It has now been discovered, however, that if both the creaming agent and the soap are added to the latex before clarification, there is no visible amount of foam-coagulum produced in the clarification step as compared with the large amount of the foam-coagulum produced where the creaming agent but not soap is added before clarification, and in addition the strainability of the final latex cream is greatly increased. It has also been found that this process permits a greatly increased feed or amount of latex passing through the clarifier in a given time, or so-called "throughput", and thus enlarges the capacity of the clarifier, such as the commercial Sharples centrifuge of the clarifier type. These improvements will be apparent from the following, all percentages referred to being by weight.

Fresh Malayan latex was conventionally preserved with 1.25% ammonia based on the latex, and there was added 0.08%

ammonium alginate based on the water of the latex, which is a conventional amount of creaming agent. In a series of runs according to the prior procedure, the thus treated latex was desludged in commercial Sharples centrifuges of the clarifier-type operating at a feed or throughput of 2000 to 2400 lbs. of latex per hour, and discharged into a mixing or storage tank to permit settling and breaking down of the latex foam. At this throughput of 2000 to 2400 lbs. of latex per hour, the foam settled fast enough so that the day's latex could be received in the mixing or storage tank. It was not feasible to run the clarifiers at higher throughputs because it was not possible to handle the foam which would then run over the top of the mixing tank. The day's operation of latex was transferred from the mixing tank to a creaming tank. The foam-coagulum which had formed would not drain out of the mixing tank. Approximately 2.5% of the dry rubber in the original latex was thus lost as foam-coagulum which remained in the mixing tank after the latex had been transferred to the creaming tank. After addition of 0.2% ammonium oleate soap based on the latex, the latex in the creaming tank was allowed to cream about two weeks to give a maximum solids content of approximately 68%. The strainability of the final creams in various runs was 3 to 4.5 gallons per square foot (using felt as the strainer) as measured by the latex strainability test shown in the Brass and Slovin article "Latex Strainability Test" referred to above. The overall recovery of rubber in the various creams averaged approximately 88%. The solids concentration of the creams was about 68%.

In another series of runs according to the present invention, the same amount of ammonium oleate (0.2% based on the latex) was added with the same amount of ammonium alginate (0.08% based on the water) to the fresh latex containing the 1.25% ammonia before clarifying, and the latex was then clarified and discharged into a mixing or storage tank. The latex was then transferred to a creaming tank and creamed for about two weeks. The strainability of the final creams in various runs was 19 to 20 gallons per square foot (using felt as the strainer) as measured by the Brass and Slovin strainability test. The Sharples clarifiers were operated at a throughput of about 400 pounds of latex per hour, and in some cases as high as 5000 pounds of latex per hour, without foam-coagulum running over the top of the mixing tank, an increase of over 50% in centrifuge capacity. There was no indication of any foam-coagulum being formed in the clarification step, and there was no residue of foam-coagulum in the mixing tank after transfer of the latex to the creaming tank. The overall recovery of rubber in the creams averaged approximately 90.5%, an increase of about 2.5% due to the elimination of the foam-coagulum. The solids concentration of the creams remained at about 68%.

The creaming agent and soap, and the amounts thereof are those conventionally used. The creaming agent may be a vegetable mucilage such as ammonium alginate, Karaya gum, Irish moss, locust bean gum or so-called carob seed gum. The amount used will depend on the type of vegetable mucilage employed, and is generally 0.05 to 1% based on the water of the latex. The soap may be an alkali soap of a fatty acid having 8 to 24 carbon atoms or of abietic acid. The term "alkali soap" is used herein in its conventional meaning as including alkali-metal, ammonium and substituted ammonium (amine) soaps but exclusive of alkali-earth soaps. The amount of alkali soap may be from .1 to .5 or more per cent based on the latex.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Process for concentrating fresh rubber latex which may be preserved with ammonia by passing through a clarifier centrifuge, said process being characterised in that an organic colloidal creaming agent and a soap for accelerating the creaming are added to the latex before clarifying.

2. Process according to Claim 1 wherein the creaming agent is ammonium alginate.

3. Process according to Claim 1 or 2 wherein the soap is an ammonium soap.

4. Concentrated latex when produced by the process claimed in any of the preceding claims.

Dated this 11th day of March, 1949.

T. A. CLAYTON.

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