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Desulfurization of tall oil fatty acids with hydrogen peroxide

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Abstract

Fatty acids of tall oil (TOFA), which are a by-product of pulp and paper production (PPP) during sulfate cooking of cellulose, have limited use due to the presence of sulfur impurities. The sulfur content acts as a deterrent to the use of FATO in the food industry. After a set of measures to remove sulfur impurities, the TOFA will be able to find its application in various food and drug industries. The aim of the study was to establish optimal conditions for the purification of the TOFA and distilled tall oil (DTM) from sulfur impurities by the action of hydrogen peroxide. The developed method of desulfurization of the gastrointestinal tract can be applied at PPP enterprises, as well as in the production of dietary supplements.

The article presents a method of desulfurization of KRATON SYLFAT™ TALL OIL FATTY ACIDS (USA) and DTM produced by Segezha Pulp and Paper Mill JSC with hydrogen peroxide. The process of removing sulfur impurities is described, the selection of reagents, their concentration and ratio, as well as the reaction time is performed. A method of desulfurization of the gastrointestinal tract with hydrogen peroxide has been developed. It is shown that the most optimal desulfurization conditions are: TOFA/H₂O₂ ratio, 1:5; H₂O₂ concentration 20%; desulfurization time 60 min. After purification, the concentration of residual sulfur in the TOFA decreases by 54% from 42.7 to 19.6 ppm. Desulfurization of DTM with hydrogen peroxide at a ratio of DTM/H₂O₂, 1:5, a concentration of H₂O₂ of 30% and a contact time of 90 minutes has a positive effect and leads to a decrease in sulfur impurities by 19% from 143.1 to 116.3 ppm.

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