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Rheology of starch and gum chañar brea mixtures

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In this work, the interaction of a mixture between soluble starch and gum chañar brea (GChB) is evaluated by rheological determinations. The objective of this study is to analyze the interactions between starch and GChB in order to establish the feasibility of link power, a parameter obtained by verifying viscosity variation and viscous flow activation energy with biopolymer concentration. The solutions were prepared in the following proportions: 2.5, 3.5 and 7% by weight of starch, mixed with GChB from 0.5-2.5% by weight. The soluble starch solutions were prepared at boiling for 5 min, to produce the imbibition of their structure and their partial solubilization. Next, the GChB was incorporated and the suspensions were cooled. The suspensions were evaluated at different temperatures (25, 30 and 40°C). The starch used was Biopack, the GChB was extracted in the Salteño forest and was purified with ethanolic extractions. The pure solutions of starch and GChB have Newtonian behavior as well as their mixtures, except when the concentration of starch is 5% and the rubber pitch of 2.5%, where a small deviation occurs. The increase in temperature, from 25 to 40°C, causes a decrease in viscosity of 34% for starch, 30% for GChB and 25% for the mixture. With the increase in the concentration of GChB from 0.5 to 2.5% in the mixture, the viscous flow activation energy decreases for the same concentration of starch by an average of 22%. These results indicate a strong interaction when the biopolymer concentration is increased.

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