THE EFFECTS OF TEMPERATURE ON VISCOSITY OILS REMOVED AT DIFFERENT STAGES OF RICE BRAN (ORYZA SATIVA L.) OIL PROCESSING

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The oil extraction process involves different temperatures and the knowledge of viscosity is necessary for the design and development of appropriate equipment and processes calculations. The aim of this study was evaluate the effects of temperature (30, 45, 60, 75, 90 °C) on viscosity oils (crude oil, degummed oil and residue of distillation from rice bran oil soapstock - RDS) removed at different stages of rice bran (Oryza sativa L.) oil processing. The rheological behavior of the oils was determined using a rotational viscometer of concentric cylinders, with a thermostatic bath attached to the equipment. The viscosity values found at constant shear rate (40 s⁻¹) and 30 °C was 0.1240, 0.0699, 0.1720 Pa.s to crude oil, degummed oil and RDS, respectively. The viscosity curves vs. shear rate were applied to Bingham and Casson models, except RDS where only the Bingham model was used. The shear stress curves vs. shear rate were applied to Newton and Ostwald-de-Waele models. It was found that the viscosity of the three oils studied decreases sharply with increasing temperature, and the RDS has the highest viscosity among the tested oil, followed by crude oil and crude degummed oil. Excepting the crude oil, all the other adjustments had a coefficient of determination ($R^2$) greater than 0.97, indicating a good adjustment of the experimental curves. Based on the degree of viscosity reduction (DVR), it was found that the viscosity of all the three oils reduced around 90% from 30 to 90 °C.