

ELABORATION AND MODELING THE RHEOLOGICAL BEHAVIOR OF PHOSPHORIC ACIDS AND STUDY OF THE MgO IMPACT ON THEIR VISCOSITIES

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March 30, 2022

Abstract

Elaboration of rheological behavior of phosphoric acids H_3PO_4 is very important. In this paper we elaborated experimentally the rheological behavior of various phosphoric acids produced in Jorf-Lasfar phosphoric plant in Morocco, including phosphoric acids (PA) of 18%, 29%, 42% and 54% in P_2O_5 . Thus, we studied the effect of temperature and density on the rheological behavior of (PA) and the influence of magnesium monoxide derived from phosphate rock, which has a remarkable impact on the viscosity of (PA). Rheological measurements are made by the rotary cylinder rheometer over the range of shear rates (1 - 1000 S^{-1}). We also were interested to establish the fluid-flow activation energy (E_a) corresponding to each acid. Our study has been completed by modeling all the rheological profiles of the acids by the regression of these profiles to the empirical models of Casson, Bingham, Power-Law and Herschel-Buckley.

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