

The structure of some fluid raw materials and their rheological behavior

Nicolae IUTES-PETRESCU^a, Mariana DINU^a, Veronica STANISTEANU^a, Melta VISINESCU^a and
Teodora IUTES-PETRESCU^b,

^a *S.N.P. PETROM INCERP Ploiesti, Republicii Blvd no. 291 A, 2000 Ploiesti, Romania,*

^b *Highschool "Nichita Stanescu" Nalbei Str. no. 3, 2000 Ploiesti Romania*

Abstract This work is focused on the rheological behaviour of some non-Newtonian fluid mixtures which contain saturated and aromatics hydrocarbons with high molecular weights, resins and asphaltenes in which various solids with given size distribution can be find. The paper presents the evolution of the rheological parameters: dynamic viscosity (η'), complex viscosity (η^*), storage modulus (G'), loss modulus (G'') and phase angle (δ) on frequency. The modeling of the above parameters was also realized. We noticed the increase of complex viscosity, the shifting of phase angle maximum towards higher frequencies and the decrease of absolute value of flow index C_2 when the petroleum coke concentration increases in the mixture as well as the increase of the absolute value of the power law index C_2 when the temperature increases. To determine the factors' contribution on rheological behaviour, we made use of the oscillator stress of the materials at various frequencies, temperatures, strains and time between the parallel plates of the Rheometrics Dynamic Analyzer RDA-700.

Key words: complex viscosity, non-Newtonian behaviour, power law indices, storage modulus.
