

Density Determination by Dilution for Extra Heavy Oil Residues Obtained Using Molecular Distillation and Supercritical Fluid Extraction as Upgrading and Refining Process

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Abstract : Density is a bulk physical property that indicates the quality of a petroleum fraction. It is also a useful property to estimate various physicochemical properties of fraction and petroleum fluids; however, the determination of density of extra heavy residual (EHR) fractions by standard methodologies, (ASTM D70) shows limitations for samples with higher densities than 1.0879 g/cm³. For this reason, a dilution methodology was developed in order to determine density for those particular fractions, 87 (EHR) fractions were obtained as products of the fractionation of Colombian typical Vacuum Distillation Residual Fractions using molecular distillation (MD) and extraction with Solvent N-hexane in Supercritical Conditions (SFEF) pilot plants. The proposed methodology showed reliable results that can be demonstrated with the standard deviation of repeatability and reproducibility values of 0.0031 and 0.0061 g/ml respectively. In the same way, it was possible to determine densities in fractions EHR up to 1.1647g/cm³ and °API values obtained were ten times less than the water reference value.

Keywords : API, density, vacuum residual, molecular distillation, supercritical fluid extraction

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