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Choice of the Optimum Method for Determination of Stability of Heavy Oils

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Asphaltenes present in heavy oils and residua strongly affect refining operations. When solution of heavy oil and residue is titrated with an asphaltene precipitant, asphaltenes start to precipitate with a specific volume of the precipitant added. The onset of asphaltene precipitation is frequently considered as an indicator of oil stability. Three methods for determination of stability of heavy oil, residua, and crude oil samples were validated. The Pauli's method is the most accurate and repeatable, and requires shorter sample preparation time than the other two methods, but the analysis time is the longest. This method is particularly useful in the analysis of samples with a moderate stability. The Heithaus' method is the simplest and can be used for both unstable and very stable samples, but it is the least accurate and repeatable. The microscopic method is considered to be intermediately advantageous between the Pauli's and the Heithaus' methods. For all of the methods applied it is recommended to dissolve unstable samples in an appropriate solvent (*e.g.* THF).