Diagnosis of asphaltene stability in crude oil through “two parameters” SVM model - DTU Orbit (03/01/2019)

Asphaltene precipitation/deposition and its imposing difficulties are drastic issues in petroleum industry. Monitoring the asphaltene stability conditions in crude oil systems is still a challenge and has been subject of many studies. In this work, the Refractive Index (RI) of several oil samples is determined using the existing SARA fractions experimental data for this purpose. The powerful Least-Square modification of Support Vector Machine (LSSVM) strategy is applied to develop a computer program, by which the asphaltene stability region can be determined for various crudes. The developed two-parameter model results show 0.6% average absolute relative deviation from the corresponding RI experimental values, measured at 293.15 K and atmospheric pressure, and squared correlation coefficient of 0.722. In the final analysis, a comparison is implemented between the obtained results of the model and previously-presented empirical correlations available in open literature. © 2012 Elsevier Ltd.
A new method of monitoring the asphaltene stability in crude oil is developed. Least-Square Support Vector Machine (LSSVM) is applied for this purpose. SARA fraction and Refractive Index data are employed for its development. Developed two-parameter model results show 0.6% AARD from the RI data. A computer program is presented as a predictive tool for detection of the stability.