

Predicting possibility of the fractional composition high-viscosity oils by the integral optical spectral characteristics

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Abstract

Express determination of the properties of hydrocarbon fractions is of great practical importance for operational control of operating modes of various technological equipment in petrochemical and oil refining industries. Currently, complex equipment is required to determine the fractional composition of high-viscosity oils. Analysis of the fractional composition on this equipment is a long process and takes several hours. Therefore, to solve the problem of Express oil quality control, the task of finding ways to quickly determine the fractional composition is urgent.

The purpose of this study is to study the possibility of fractional composition of high-viscosity oils by integral spectral descriptors of optical absorption.

Processing of data on the fractional composition of oil fractions and optical spectra in the UV and visible ranges by the least squares method established a linear relationship between the temperature parameters (the boiling point and the boiling point) and the integral parameters (the integral forces of the oscillator) of the optical absorption spectra. The adequacy of the results is confirmed by statistical data processing. The correlation coefficients for the start and end boiling point are 0.97. The absolute error of the calculations is 11.24, the relative error is from 3.90 and 3.64, respectively. These values are within the experimental error, which indicates the adequacy of the calculated data.

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