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Electron paramagnetic resonance studies of asphaltenes complexes in heavy oils and bitumen

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Abstract

The present paper is focused on the application of some of the multifrequency (9.5 and 94 GHz) continuous wave and pulsed EPR techniques to study the dynamics and structure of asphaltenes and vanadyl complexes from the crude oils and bitumen at near room temperature. The features of the observation of EPR in these systems at high frequencies are pointed out. Longitudinal and transverse relaxation times of asphaltenes and vanadyl complexes are measured. Usage of the data obtained for DNP of protons of crude oils and bitumen is discussed.

Keywords

Asphaltenes, Dynamic nuclear polarization (DNP), Electron paramagnetic resonance (EPR), Vanadyl