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## The Application of Microemulsions for the Extraction of Hydrocarbons as Chemical Markers of Oil from Rocks and Oil Cores with Subsequent HPLC Analysis

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Nowadays the detection of hydrocarbon chemical markers for the determination of oil field is of current interest. Individual components of oil, for example, aromatic polycyclic hydrocarbons (PAH) can be treated as markers. Usually such solvents as hexane and acetonitrile are used for the extraction of PAHs from rock-oils. Due to peculiar properties of microemulsions (ME) as nanostructured systems they can be used in fluorimetry for the development of methods of organic compounds identification even in trace amounts. Intensity of fluorescence increases and excitation energy consumption for nonradioactive transitions decreases when ME are used as media. The main factors affecting fluorescence intensity of compounds are surfactant charge, structure of oil component, pH and the temperature of the solution.

The main point of the work is the application of microemulsions for the extraction and simultaneous pre-concentration of chemical markers of oil. If hexadecyltrimethylammonium bromide (CTAB) is used as microemulsion surfactant, an addition of excess amount of sodium sulfate causes the decomposition of such ME with the formation of two phases – organic and aqueous. Rock-oil components, PAHs in particular, have a low water solubility and hydrophobic nature ( $\log P \geq 3.30$ ). Thus, after the decomposition of ME they migrate to organic phase and their concentration increases due to decrease in phase volume takes place. The method was used for the analysis of several cores containing different amounts of oil components (from none to excess). This fast technique requires remarkably less time- and labour-consumption and looks very perspective. The concentration factor is 5-10 when ME consists of CTAB, heptane and n-butanol. HPLC method with fluorometric detector was used to analyse such extracts.

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