

INVESTIGATION OF PHASE TRANSITIONS OF N-ALKANES NANOEMULSIONS BY MEANS OF DYNAMIC AND STATIC LIGHT SCATTERING

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In this work we present the results of studies of phase transitions (melting, crystallization, rotational phases of paraffins) by dynamic and static light scattering in aqueous emulsions of individual paraffins $C_{19}H_{40}$, $C_{20}H_{42}$, $C_{21}H_{44}$, $C_{23}H_{48}$, $C_{24}H_{50}$, $C_{25}H_{52}$, $C_{26}H_{54}$, and $C_{28}H_{58}$ and some binary mixtures of these paraffins. Emulsions were prepared by ultrasonic dispersion without the use of surfactants and remained stable throughout the year; the characteristic emulsion size is about 100 nm. Paraffin emulsions are promising material for Phase Change Materials (PCM) applications (heat transfer, heat storage, conditioning).

Using the dynamic and static light scattering methods, these emulsions were studied in a wide temperature range. Authors proposed a new method for determining the temperatures of phase transitions of paraffins based on an analysis of the temperature dependences of the intensity of scattered light [1,2]. The phase transition temperatures of individual paraffins determined in this paper agree well with the available published data.

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1. V.N. Kuryakov et al 2018 IOP Conf. Ser.: Mater. Sci. Eng. 347 012034. <https://doi.org/10.1088/1757-899X/347/1/012034>.
 2. Ivanova D. D., Kienskaya K. I., Kuryakov V.N. *Uspekhi v khimii i khimicheskoy tekhnologii: sb. nauch. tr.* [The successes of chemistry and chemical technology, a collection of scientific papers], 2017, V. XXXI, 4 (185), 88-90.