



*Thematic section:* Physicochemical Research.

**Analytical Review**

*Subsection:* Petrochemistry.

*The Reference Object Identifier* – ROI-jbc-A/21-2-3-18

*The Digital Object Identifier* – DOI: 10.37952/ROI-jbc-A/21-2-3-18

Received 14 July 2021; Accepted 17 July 2021

## **Influence of the colloidal structure of oil residues on the yield of volatile thermolysis products**

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**Keywords:** model of the colloidal structure of oil residues, donor-acceptor complexes.

### **Abstract**

The effect of the dispersed structure of mixtures of aromatized oil residues – asphalt from deasphalting of tar with propane, with a concentrate of polycyclic arenes – distillate of the electrode calcining process, on the yield of volatile thermolysis products has been established. Asphalt from deasphalting is a dispersed system in which polyaromatic asphalt-resinous substances are dispersed in a low molecular weight hydrocarbon medium. Therefore, in mixtures with a high content of asphalt-resinous substances and polycyclic arenes, the formation of molecular (donor-acceptor) complexes is possible.

The change in the structure of the mixtures was judged by the yield of volatiles at 200 °C. The curves of weight loss versus temperature were recorded by thermogravimetric analysis (TGA) on a conventional derivatograph. The sample, placed in a ceramic crucible without a lid, was heated in a dynamic atmosphere of evolved volatiles and helium flowing around the crucible. There are sharp maxima of gas evolution from mixtures containing 15, 25 and 60% of the mass. asphalt from deasphalting. The polyextremal nature of gas evolution apparently indicates the formation, at a certain stoichiometric ratio of the components, of molecular complexes with properties different from those for the initial mixtures. A significant volume of gaseous products is probably associated with the destruction of the supramolecular bulk structure, which retains the volatiles in the dispersed system. It is logical to assume that it is, apparently, a gel-like grid in which the complex formation process, upon mixing, weakens or enhances the rigidity of the grid, which affects the volatility of the components immobilised by it. Probably, the grid is formed from molecules of asphaltenes, resins, and polycyclic arenes, which form molecular complexes with charge transfer in the volume of the dispersed medium.

**For citation:** Alexander B. Marushkin, Mikhail Yu. Dolomatov, Oleg P. Zhurkin. Influence of the colloidal structure of oil residues on the yield of volatile thermolysis products. *Butlerov Communications A*. **2021**. Vol.2. No.3. Id.18. DOI: 10.37952/ROI-jbc-A/21-2-3-18

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- [22] Alexander B. Marushkin, Mikhail Yu. Dolomatov, Oleg P. Zhurkin. Influence of the colloidal structure of oil residues on the yield of volatile thermolysis products. *Butlerov Communications*. **2021**. Vol.67. No.8. P.68-73. DOI: 10.37952/ROI-jbc-01/21-67-8-68 (Russian)