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Study of graphite-like materials obtained from coal-tar pitch

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Abstract

In the research, the study of precursors of graphite-like materials obtained from medium-temperature coal tar pitch was carried out on the individual components of coal tar pitch by separating the multicomponent composition of the pitch into separate fractions. Such approach, to study the physicochemical characteristics of the individual components of coal tar pitch, contributes to both the determination of the contribution of individual pitch components to the process of its structuring during carbonization and the development of new environmentally friendly methods for the synthesis of functional materials for various applications. The β-fraction was precipitated with n-hexane from toluene extract of coal tar pitch. γ-fraction was isolated from n-hexane by solvent evaporation. α2-fraction was isolated from the residue, insoluble in toluene, by quinoline extraction. The composition and structure of the isolated individual fractions of coal tar pitch were studied by physicochemical methods of analysis. The shape and morphology were investigated by electron microscopy. To study the composition and structure, the methods of elemental analysis, infrared spectroscopy, electron-paramagnetic resonance, XRD-analysis, and thermoanalysis were used in combination with methods of derivative analysis, chromatography, and mass spectrometry. The authors of the work propose new approaches to the use of individual fractions of coal tar pitch in order to obtain new graphite-like materials on their basis.

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