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# Sorption Properties of Carbon Composite Materials Formed from Layered Clay Minerals

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**Abstract:** The sorption properties of carbon-composite materials based on montmorillonite and hydrotalcite matrices have been studied using nitrogen adsorption isotherms and inverse gas chromatography. Carbon composite materials derived from both types of inorganic precursors contain pore structure accessible for adsorbate molecules. Adsorption capacity per unit mass of these composite adsorbents is larger in the case of hydrotalcite than in montmorillonite-based materials. Exposing these materials to ambient conditions results in their hydration. Subsequent water removal by heating under vacuum increases nitrogen adsorption capacity, which is explained by the opening of the adsorption space. The water content of hydrated samples and its effect on adsorption capacity is greater for the case of hydrotalcite-based materials. No direct relationship between carbon content and adsorption properties of the materials studied is observed.

**Key Words:** Carbon • Hydrotalcite • Inverse gas chromatography • Montmorillonite • Nitrogen sorption • Surface energy

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