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Novel Asphalt-based Carbon Adsorbents with super-high adsorption capacity and excellent selectivity for Separation for Light hydrocarbons

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ABSTRACT

Separation and recovery of light hydrocarbons (C₂-C₃) from gaseous mixtures (C₁-C₃) such as natural gas is of importance for the petroleum industry, and is profitable for natural gas producers if it can be done at normal temperature. In this work, novel asphalt-based activated carbons (A-ACs) were prepared by using asphalt as carbon source for separation of light hydrocarbons. The resultant A-ACs were characterized, and C₃H₈, C₂H₆ and CH₄ adsorption isotherms of A-ACs were measured. Besides, their dynamic separation performance were investigated by fixed bed experiments. The resulting A-ACs exhibited a superior C₃H₈ and C₂H₆ adsorption capacity of 11.76 and 6.59 mmol/g at 298 K and 100 kPa, respectively and their BET surface area reached as high as 3131 m²/g; The IAST-predicted C₂H₆/CH₄ and

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