

Activated carbon prepared from asphaltenes

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Abstract

Asphaltenes are present in most petroleum crudes, in heavy oil and in bitumen from oil sands. They are defined as the heaviest components of petroleum that are insoluble in light n-alkanes such as n-pentane (n-C₅) or n-heptane (n-C₇), but soluble in aromatics such as toluene. These molecules consist mostly of polynuclear aromatics with different proportions of aliphatic and alicyclic moieties and small amounts of hetero atoms (such as oxygen, nitrogen, sulfur) and metals. The fact that they have a very high carbon content which can reach more than 80 wt% makes them attractive candidates for the production of activated carbon. In this research, granular activated carbon was prepared using asphaltenes as the precursor material. Using different carbonization and activation conditions (temperature, time, physical/chemical activation), it was feasible to produce activated carbon with different porosity characteristics. A detailed characterization of the carbon structure will be presented and discussed.