Carbon foam from modified commercial coal tar pitch for use as catalyst support and construction material

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Carbon foams with excellent mechanical characteristics were obtained from modified coal tar pitches. It was established that the composition and softening point of the pitch precursor significantly affect the foaming process as well as foam structure, and therefore foam properties.

The composition and properties of the modified and synthetic pitches allow foam formation at relatively low pressure and fast heating rate of the precursor during the foaming process without a stabilization treatment.

Thermo-oxidation modification of commercial coal tar pitch with mineral acid (nitric and sulfuric) is appropriate treatment to adjust its plastic properties before foaming process - the main factors controlling the final product properties are the temperature and the amount of modifying agent.

Obtained pitches are suitable foaming precursor and they produce anisotropic carbon foam with high mechanical strength. The higher content of petroleum ether soluble fraction and lower content of quinoline insoluble fraction in pitch treated with nitric acid lead to formation of bigger crystallites, which ensures lower porosity and higher strength of the final carbon foam.