

Raman scattering in porous carbon materials

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At the present time metal carbides are used to produce carbon materials with a variety of properties. After the carbide's sublattice is destroyed by thermochemical process, free carbon atoms form a new porous structure. Produced carbon materials are characterized by its pureness and extremely high specific surface area (up to 2000 m²/g). These properties of carbide derived carbons (CDCs) are widely used in supercapacitors, catalytic composites and sorbents.

The study of Raman scattering in samples of nanoporous carbon derived from silicon carbide was carried out in this work. Experiments were run on a series of samples treated thermochemically at temperatures from 700 to 2000° C.

During the research of carbon samples the spectra of Raman scattering were obtained. The spectra indicate dependence between material's structure and the temperature of treatment. This can help us to explain the process of nanoporous carbon production: with rising of the temperature the amount of sp² form of carbon increases and the amount of sp³ form lessens. It conforms to the fact that graphite (sp² form) is thermodynamically stable form of carbon. And an opposite carbon transformation from sp² form to sp³ one while annealing in the hydrogen atmosphere occurs to be an especially interesting fact.

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