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carbonaceous mesophase

A liquid-crystalline state of pitch which shows the optical birefringence of disc-like (discotic) nematic liquid crystals. It can be formed as an intermediate phase during thermolysis (pyrolysis) of an isotropic molten pitch or by precipitation from pitch fractions prepared by selective extraction. Generally, the spherical mesophase precipitated from a pyrolysing pitch has the Brooks and Taylor structure. With continuous heat treatment the carbonaceous mesophase coalesces to a state of bulk mesophase before solidification to green coke with further loss of hydrogen or low-molecular-weight compounds.

Note:

In the formation of carbonaceous mesophase by thermolysis (pyrolysis) of isotropic molten pitch, the development of a liquid-crystalline phase is accompanied by simultaneous aromatic polymerization reactions. The reactivity of pitch with increasing heat treatment temperature and its thermosetting nature are responsible for the lack of a true reversible thermotropic phase transition for the bulk mesophase in most pitches. Due to its glass-like nature most of the liquid-crystalline characteristics are retained in the super-cooled solid state.

Source:

PAC, 1995, *67*, 473 *(Recommended terminology for the description of carbon as a solid (IUPAC Recommendations 1995))* on page 483

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