

Effect of Heattreatment time and Temperature on Mesophase formation from Naphtha Cracking Bottom oil

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Naphtha cracking bottom oil(NCB) was reformed at 410~450oC to obtain precursor mesophase pitch(F0) for carbon fiber, and 3-steps solvent extraction was processed to get oil ingredient (F1), asphaltene(F2), pre-asphaltene(F3), and THF-insolubles(F4). Precursor pitch, asphaltene, and pre-asphaltene were slowly heated at 400~480 oC , N₂ atmosphere to form ing large molecules that aggregate into a liquid crystalline phase with a nematic order. This phase, called the mesophase. It forms small liquid spherules which grow in size, coalesce into larger spheres, and eventually become extended anisotropic regions.

Mesophase content and C/H ratio increased as the heat treatment time increased at the temperature with component analysis.

Mesophase formation observed by HOT-stage polarizing microscope, for precursor mesophase pitch(F0), mesophase was formed from 410oC, and solidified at around 480'c, and for pre-asphaltene(F3), mesophase was formed at around 440 oC, solidified at around 460 oC.