

### **delayed coking process**

A thermal process which increases the molecular aggregation or association in petroleum-based residues or *coal tar pitches* leading to extended mesophase domains. This is achieved by holding them at an elevated temperature (usually 750–765 K) over a period of time (12 to 36 h). It is performed in a coking drum and is designed to ultimately produce *delayed coke*. The feed is rapidly pre-heated in a tubular furnace to about 760 K.

Notes:

*Needle coke* is the premium product of the delayed coking process. It is generally produced from highly aromatic residues from, for instance, the steam cracking of gas oil. Its appearance and preferred orientation of the *graphene layers* is a consequence of the evolved gaseous products percolating through the mesophase which must not have too high a viscosity. A close control of temperature, time and feedstock is essential. Lower grades, for instance isotropic cokes, are used for *carbon electrodes* applied, for example, in the production of aluminium.

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