NEW FLUOROCARBON MATERIALS BY DIRECT FLUORINATION OF PITCH

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Graphite fluorides,(CF)n and $(C_2F)n$ are well known as the products by direct fluorination of graphite,and have already been commercialized as the cathode mass of lithium batteries ,etc. These compounds are generally prepared from rather well ordered carbon at temperatures higher than 350°C. In the present study,pitches which are precursor materials of graphite were reacted with fluorine by a substitution and an addition reaction in fluorine gas(F_2) at lower temparature than 100°C. Pitch fluoride is a novel fluorocarbon having excellent properties comparable or superior to those of graphite fluorides ,(CF)n , $(C_2F)n$ and PTFE.

Pitch + F_2 ⟶ Pitch fluoride

(H/C=0.5)

(F/C=0.8 - 1.6)
- Powdery form
- Glass form
- Mean molecular weight 1,000 - 3,000

Features
- Outstanding properties similar to those of graphite fluoride.
- Producted by a economical manufacturing process.(Low reaction temperature,short reaction time)
- Possesses excellent water repellant properties. Contact angle of water for pitch fluoride is 145° .
- Thin films can be formed with vacuum deposition processes.
- Pitch fluoride is soluble in some solvents and has a wider range of applications.