

## CHEMICAL PROPERTIES OF NEW FLUORINATED CARBON MATERIALS FROM PITCH

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In previous work, new fluorinated carbon materials were synthesized by direct fluorination of various coal tar pitches. But there were always problems in that process because of large generation of heat.

Then we try to control the reaction temperature by flow rate of  $F_2$  and cooler set in the reactor.

As a result,two types of fluorinated pitches were synthesized at different reaction temperatures, a low-temperature type (L) and a high temperature type (H).

The result of elemental analysis showed that F/C ratio of the type (H) is larger than that of the type (L). The type (H) shows whiter color than the type (L). This result seems to be concerned with the amount of the residual double-bonds in the fluorinated pitch.

$^{19}F$ -NMR spectra showed that the type (H) has more amount of  $-CF_2CF_3$  chemical shift.It is considered by the ring-opening reaction because starting pitch has few ethyl-chain. Therefore the high temperature condition seems to produce the more ring-opening reaction.

Mean molecular weights by VPO measurement showed that Mw. of the type (H) is about 3,000. That value is in accordance with the estimated value by Mw. of starting pitch and F/C. On the other hand, that of the type(L) reaches about 5,000, which indicates a form of recombinations of cleaved bonds through low temperature condition and stable fluoination.