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A Sintering Mechanism of KMFC Green Compact for High Density Carbon Blocks*

Synopsis:

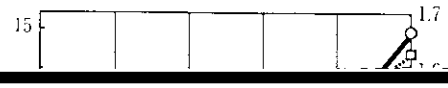
Kawasaki Steel's new carbon powder, KMFC (Kawasaki mesophase fine carbon) is produced from mesophase spherules formed by heat-treating pitch. KMFC has outstanding self-sinterability to produce isotropic carbon blocks of high density and strength without any extra

Table 2 Properties of KMFC used in this study

(wt%)

gen atmosphere flow rate, 100 ml/min.

The physical properties of the green and heat-treated



14.0

Sample	Heating rate

proceeds and particles adhere through fusion of a binder component around the mesophase spherules which

with the binder component in the KMFC particles.

The influence of heating rate on the degree of fusion has been reported for coal.[12-14] Mochida and co-workers have reported that a rapid heating rate shifted the evolution point for volatile matter to a higher temperature, and that the influence of this volatile matter became more significant to carbonization. Therefore,

(2) The light fractions such as HS, AS and TMO play an important role in achieving the high densification and high strength of the KMFC compact by governing the fusibility of the binder component in KMFC particles between 400°C and 600°C.
(3) Rapid heating accomplishes high densification of the KMFC compact as it promotes fusion due to the

During the sintering process for the KMFC compacts, the higher heating rate of 10.4°C/h allowed greater

rate of 5.2°C/h by retarded evolution. This result also

1) J. D. Brooks, and G. H. Taylor: *Carbon*, **3**(1965)2, 185