

PETROGRAPHIC COMPOSITION AND THE
PLASTIC PROPERTIES OF COAL

by

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Abstract*

This investigation was initiated to determine the effects of coal petrographic composition on its plastic properties as determined by dilatometric and plastometric measurements. In addition, the effects of crucible design of the Gieseler plastometer were investigated in terms of their effect on the resultant readings. The optical changes and reflectance of the semi-coke residues were determined in order to evaluate the effects of temperature on the petrographic components as the coal is being carbonized. A wide range of metallurgical coking coals were evaluated in these studies. The results show that: (1) Modifications of the Gieseler crucible and testing procedures improved the results of the tests; (2) The petrographic composition of the coal correlates well with the plastic properties as determined by the modified techniques; (3) Normal ASTM Gieseler data do not measure the actual plastic properties of coals or coal blends; (4) Heating rate drastically affects the behavior of the petrographic entities during plasticity tests; and (5) Petrographic and reflectance studies of the semi-coke residues proved to be useful in explaining certain phenomena taking place during carbonization.

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