

THERMOGRAVIMETRIC INVESTIGATIONS IN PREDICTION OF COKING PROPERTIES AND COKE STRUCTURE OF INERTINITE RICH COALS

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Inertinite rich coal samples (having 36.1-54.4 modal percent inertinite content) of medium rank with different petrographic composition belonging to limnic and paralic facies were collected. Thermogravimetric investigations (DTA, DTG and TG) were carried on these samples and the caking properties, coke microtexture, structure and strength were determined in the laboratory. ΔH and ΔH_{max} (heat absorption during temperature T_A - T_B and T_a - T_b respectively under main endothermic area of DTA curves causing loss in weight $L_m \Delta T_B - T_A$ and $L_m \Delta T_b - T_a$ under TG curves in turn) were determined.

ΔA and ΔA_{max} (main decomposition area during temperature T_p - T_k and T_1 - T_2 of DTG curves respectively causing loss in weight $L_m \Delta T$ and $L_m \Delta T_{max}$ in the order mentioned) were measured. The temperature differences $\Delta T_B - T_A$, $\Delta T_b - T_a$, $\Delta T (= T_k - T_p)$ and $\Delta T_{max} (T_2 - T_1)$ were noted. Correlation between (a) Petrographic caking ratio, (PCR) and Roga's index (RI, caking properties), (b) $\Delta H_{max} / \Delta A_{max}$ and RI, (c) $\Delta H_{max} / \Delta A_{max}$ and PCR, (d) petrographic structural ratio (PSR) and mosaic content, (e) $L_m \Delta T_{max} / T_{max}$ and mosaic coarse content, (f) $L_m \Delta T_{max} / \Delta H_{max}$ and PSR, (g) $\Delta A_{max} / L_m \Delta T_{max}$ and coke strength, (h) $L_m \Delta T_B - T_A / \Delta T_B - T_A$ and P_1 (mean pore size of coke) and (i) $L_m \Delta T_B - T_A / L_m \Delta T$ and DD (compactness of coke), were found. Thermogravimetric investigations may be a good, quick and reliable method for prediction of coking properties and coke structure of coal.