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Thermogravimetric Characterization of Turkish Bituminous Coals for Combustion

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Abstract: This study focused on the thermal gravimetric characterization of Turkish bituminous coals for combustion. The combustion properties considered were based on the burning profile of coal samples and their chars produced in a PL 1500 TGA apparatus. The coal seam samples used in the study were obtained from TTK (Turkish Hardcoal Enterprise) mines as channel samples. The majority of the samples from 12 seams were medium-volatile bituminous and only three of them were high-volatile bituminous. Combustion profile parameters of coal samples and chars were correlated with petrographic, proximate and ultimate analysis data in order to establish the combustion differences of the samples. The results indicated that only the combustion profile parameters of ignition and burnoff temperatures of coal were correlated with H/C ratio, fuel ratio and petrofactor. The amount of total reactive macerals showed a strong relationship with char reactivity for the same rank coal samples. However, the same result was not obtained for the whole range of coal samples, since rank effect was not included. The petrofactor, combining both effects of petrographic composition and reflectance data, showed a strong relationship with char reactivity for the whole range of coal samples.

Key Words: Thermal analyses, Coal combustion, Char reactivity.

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