Title : Physical Characteristics and Chemical Composition of Coal at Stock Yard and Stockpile in Mae Moh Mine, Mae Moh District, Lampang Province

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ABSTRACT

This study aims to investigate the internal composition and quality of coal from the Mae Moh Mine, Lampang Province, Thailand, by comparing 9 samples collected from the stock yard and stockpile areas. The stock yard samples include K1 K2 K3 Q1,2, and Q3,4 whereas the stockpile samples consist of SP7/2 and SP7/3, which were stored in shaded conditions, and SP5/4 and SP6/6, which were outdoor spots. Coal petrographic analysis was conducted using reflected-light microscopy together with fluorescence observation to identify mineral matter. In addition, proximate analysis was performed to evaluate the relationship between storage conditions and coal quality.

All samples are vitrinite-dominated. K zone contains 61% vitrinite, 35% liptinite, and 4% inertinite and mineral matter, whereas the Q zone contains 74% vitrinite, 24% liptinite, and 2% inertinite and mineral matter. Shaded stockpile samples show 81% vitrinite, 18% liptinite, and ~1% inertinite and mineral matter, while exposed samples contain 74% vitrinite, 23% liptinite, and 3% inertinite and mineral matter. Pyrite and clay minerals occur as dispersed inorganic constituents in all samples. The primary maceral composition remains broadly similar regardless of storage condition.

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Proximate analysis shows that stock yard samples have consistent values (moisture ~8%, ash ~16%, volatile matter ~39%, fixed carbon ~37%). Shaded stockpile samples exhibit increased ash (~25%) and reduced volatile matter (~36%) and fixed carbon (~31%). Exposed samples show greater variability, with ash ranging from 14% to 40%. The elevated ash content in certain exposed samples likely reflects external mineral contamination rather than intrinsic changes in mineral composition. Integrated petrographic and proximate data indicate that storage conditions affect physical properties and proximate analysis results, although the main organic composition remains similar in all samples. This study helps explain the mechanism of coal quality change in stockpile areas and can be used as a guideline for coal storage management to reduce contamination and maintain coal quality appropriately.

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