

Title : Characteristics and Distribution of Pyrite in K-Zone and Q-Zone Coal, Mae Moh Mine, Lampang Province

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ABSTRACT

Studying pyrite characteristics and distribution in the K-and Q-zone coals at the Mae Moh Mine, Mae Moh District, Lampang Province, can provide insights into the factors contributing to the high sulfur content in the mine. Pyrite is the common sulfide mineral discovered in the Mae Moh Mine, indicating a high sulfur content in coal seams. The issue of high sulfur levels in the Mae Moh coal remains uncertain, as sulfur affects the quality of coal supplied to the power plant. This study aims to investigate the distribution of pyrite within K-and Q-zone coals to characterize pyrite crystal morphology using a reflected light microscope and a scanning electron microscope (SEM). A total of 20 coal samples were examined. These findings indicate that all samples exhibit crystalline pyrite, with an average diameter of less than 25 micrometers. There are two identified morphologies of pyrite: framboidal and disseminated. Framboidal pyrite consists of minute pyrite crystals arranged in a structure that resembles a raspberry. However, disseminated pyrite is characterized by the random distribution of fine pyrite crystals. Both types of pyrite are associated with biological or organic matter, particularly sulfate-reducing bacteria (SRB), which play a key role in pyrite formation in sulfate-rich sediments. These bacteria reduce sulfate to sulfide, reacting with iron to precipitate as fine-grained pyrite. The irregular distribution and incomplete crystallization of pyrite suggest that its formation occurred in an anoxic environment influenced by microbial activity. Additionally, pyrite is more abundant in Q-zone coal than in K-zone coal. The results of this study can serve as a guideline for planning coal stockpile management and as supporting data for selecting or designing appropriate desulfurization methods to improve coal quality by power plant standards.

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