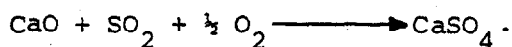


Thesis Title      Coal Briquette Desulfurization by Lime,  
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#### ABSTRACT

Coal is widely used as fuel in various industries, and coal fines left over can be made into coal briquettes. The combustion of coal briquettes causes corrosion and air pollution problems, which is due to sulfur in coal. For these reasons, coal briquette desulfurization by the use of lime is studied. CaO in lime reacts with SO<sub>2</sub> which occurs during combustion according to the equation;



The resulting CaSO<sub>4</sub> will remain in the ash after combustion. In this research, the variables that affect the desulfurization of coal briquettes at true operating conditions in cooking stove were studied. They were : amount of lime added in terms of mole ratio of CaO/S from 0 to 4, percentage of clay used as binder from 0 to 40, and types of coal fines from various sources; Mae Moh, Bang Poo Dum, Klong Wai Lek, Ban Poo, and Pah Kha,

The result shows that lime is very effective for coal briquette desulfurization. When amount of lime added (mole ratio of CaO/S) was increased, the amount of sulfur absorbed by lime in the form of calcium

sulfate in ash increased rapidly and its rate became slower at CaO/S mole ratio greater than 2. Total sulfur retained in ash became constant at approximately 90-95%, based on total sulfur initially present in coal. In other words sulfur emission to the atmosphere was only 5-10%. The effect of clay to desulfurization was less, with the amount of clay added up to 40%, sulfur retained in ash increased by 10 to 15%. Comparison among various types of coal led to the conclusion that desulfurization trends were similar.

In conclusion, it was found that coal briquettes from various important sources in Thailand could be well desulfurized by lime. The recommended values of CaO/S mole ratio is in the range 2.0-2.5 with 20% clay addition.