

Gan Suppanirun 2010: Effect of Moisture on Spontaneous Combustion of Subbituminous Coal. Master of Engineering (Fire Protection Engineering), Major Field: Fire Protection Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Metta Chareonpanich, D.Eng. 179 pages.

This research aimed to study effects of the moisture and particle size, as well as heating period and temperature on the spontaneous combustion of 3 samples of subbituminous coal from 2 sources of Indonesia and 1 sample of subbituminous coal from South Africa (total of 4 samples). The experiment was performed in the in-house test set by using the cross point temperature method and the initial temperature method. It was found that the appropriate air flow rate for the spontaneous coal combustion obtained from the cross point temperature method was 1,200 ml/min with the minimum temperature of 166 °C. For the study of the initial spontaneous combustion temperature of coal sample, it was found that the Indonesian ADARO 266 coal of smaller than 75 µm revealed the lowest combustion temperature at 148 °C. In the case of the spontaneous combustion of each size of coal, the coal of smaller than 75 µm exhibited the lowest initial spontaneous combustion temperature than those of 75-106 µm and 106-250 µm. Subsequently, ADARO 266 coal of smaller than 75 µm was exposed to moist air to increase the moisture and tested for the spontaneous combustion. It was found that the coal sample with the highest moisture content had the highest initial spontaneous combustion temperature. Moreover, this coal sample also required the longest heating period for spontaneous combustion at the same temperature.

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Student's signature

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Thesis Advisor's signature