

Influence of Coal Properties and Combustion Conditions on Specific Surface Area of Fly Ash

Masayoshi Kimoto, Hiromitsu Matsuda, Hiromi Shirai

Central Research Institute of Electric Power Industry, Energy Engineering Research Laboratory, 2-6-1 Nagasaka, Yokosuka-shi, Kanagawa-ken 240-0196 JAPAN

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ABSTRACT

In the utilization of fly ash as a concrete mixing material, it is important to know an adsorption amount for added surfactant such as air entraining agent beforehand. Generally, the surfactant adsorption amount is in proportion to a specific surface area, for example measured by B.E.T. method with nitrogen, and the specific surface area of fly ash depends on unburned carbon concentration in fly ash. However, it is shown that the specific surface area at the same unburned carbon concentration in fly ash is different among coals with a strictly comparison. In this study, a cause for its difference was clarified.

In pulverized coal fired power stations of Japan, Methylene-Blue adsorption amount (for short, MB), which correlates closely with the specific surface area, is always measured to judge the propriety of utilization, since its measurement is very simple. Then, we evaluated MB data for many kinds of coal instead of the specific surface area. It was confirmed that the difference for MB to mineral matter among coals was not much. On the other hand, it was cleared that MB to unburned carbon increased with the decrease of Fuel-ratio, which is defined as a ratio of the fixed carbon content to the volatile matter content. In blended combustion of two coals, MB was close to that in higher Fuel-ratio coal, because unburned carbon in higher Fuel-ratio coal was greater than that in lower Fuel-ratio coal. MB in partial load condition was almost the same with MB in standard load.

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