

# Characteristics of Kentucky Coal and Coal Ash

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## ABSTRACT

The Clean Air Act Amendments of 1990 (Title III and Title IV) have placed increasingly stringent limits on the type and grade of coal that can be mined and marketed. Because of these limitations it has become increasingly important to understand the quality characteristics of coal in Kentucky from a utilization perspective, both on an geographic and stratigraphic basis. Coal quality parameters are also important in predicting the tendency of a coal to form excessive slagging and/or fouling deposits in combustion furnaces. Furthermore, data on the composition of coal ash has important ramifications from a disposal standpoint. This paper will focus on the quality characteristics of Kentucky coal, and the distribution of selected major and minor elements in the post-combustion ash byproduct.

Coal in Kentucky is mined in the eastern and western part of the state. In eastern Kentucky, much of the resource occurs as compliance ( $< 1.2$  pounds  $\text{SO}_2$  / million BTU), or near-compliance coal ( $< 2$  pounds  $\text{SO}_2$  / million BTU). In contrast, coal in western Kentucky has a medium to high sulfur content (typically  $> 5$  lbs  $\text{SO}_2$  / million BTU). In both areas, quality varies both geographically and stratigraphically. Ash byproducts of eastern Kentucky coals are typically enriched  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  and  $\text{TiO}_2$  (so-called acids, or glass formers) and depleted in  $\text{Fe}_2\text{O}_3$ ,  $\text{CaO}$ , and  $\text{SO}_3$  (so-called bases, or fluxing agents) when compared with western Kentucky coal. Likewise, eastern Kentucky coals typically contain higher amounts of chlorine, cobalt and thorium than do western Kentucky coals, which are enriched in cadmium, manganese and lead.