

Mercury in the Coals and Fly Ashes from Bulgarian Power Plants, Irena J. Kostova, Sofia University “St. Kliment Ohridski,” Department of Geology and Paleontology, 1000, Sofia, Bulgaria, irenko@gea.uni-sofia.bg; James C. Hower, University of Kentucky, Center for Applied Energy Research, Lexington, KY 40511, hower@caer.uky.edu; and Daniel J. Hedges, Engineering Consulting Services Inc., Lexington, KY

The concentration, distribution, mode of occurrence, and origin of mercury in feed coals and fly ashes from four of the biggest power plants in Bulgaria (Maritza East 2, Maritza East 3, Republika, and Bobov Dol) were investigated. This study is based on four average raw feed coal and eight fly ash samples, collected from bunkers and three rows of electrostatic precipitations from power plants. The feed coals are lignite and subbituminous, with high ash and high to moderate sulphur content.

Mercury analysis, on a whole coal or whole ash basis, was performed on a LECO AMS254 Advanced Mercury Analyzer.

The mercury content of the coals, reported in parts per million (ppm) in the ash, varies from 0.24 to 0.14. These values of mercury concentrations are below average in comparison with other coals in the world.

The amount of mercury in fly ashes exceeds 0.04 ppm. The highest concentration of 0.12 ppm was received for Republika fly ash.

In contrast with frequently observed positive correlation between Hg content and fly ash carbon content, the finest fly ash fractions had greater concentrations of Hg (0.24 ppm for Republika and 0.05 ppm for Bobov Dol) than the higher-carbon coarser fractions in the ashes from Republika (0.02 ppm) and Bobov Dol (0.04 ppm) power plants. In these cases, Hg capture by fly ash is dependent upon flue gas temperature and increases with a decrease in flue gas temperature.