

GENERAL PAPERS - POSTER SESSION
PRESENTED BEFORE THE DIVISION OF PETROLEUM CHEMISTRY, INC.
AMERICAN CHEMICAL SOCIETY
WASHINGTON, D. C. MEETING, AUGUST 28 - SEPTEMBER 2, 1983

RAPID DISSOLUTION OF COAL FOR ANALYSIS FOR
SULFUR, IRON, AND OTHER ELEMENTS

By

R. Markuszewski, B. C. Wheeler, and R. S. Johnson
Iowa State Mining and Mineral Resources Research Institute
Iowa State University, Ames, Iowa 50011

and

C. C. Hach
Hach Chemical Company, P.O. Box 389, Loveland, Colorado 80537

ABSTRACT

Most dissolution methods necessary for the determination of major, minor, and trace constituents in coal are tedious and require unusual procedures. A rapid dissolution method is based on heating 250 mg coal with 10 ml of a 4:3:3 mixture of HNO_3 , HClO_4 (72%), and H_3PO_4 (85%). In numerous analyses of 8 subbituminous and bituminous coals using a simple digestion apparatus, the entire sample was dissolved in 20-45 min., leaving silica in a pure form suitable for determination by filtration, ignition, and weighing as SiO_2 . In the clear filtrate, total sulfur was determined by a turbidimetric measurement of BaSO_4 . For the 8 coals, containing 0.41-4.20% S, the results agreed well with those obtained by using a combustion method followed by automatic iodometric titration of the SO_2 . In other aliquots of the same filtrate, total iron was determined spectrophotometrically using FerroZine. For an iron range of 0.113-1.762%, the standard deviations were 0.001-0.050. The clear digest can be also used to determine other elements by spectrophotometric, atomic absorption, or other procedures.