

TRACE ELEMENT BEHAVIOR IN THE SOLVENT REFINED COAL PROCESSES. R. H. Filby, S. R. Khalil,* and M. L. Hunt. Nuclear Radiation Center, Washington State University, Pullman, Washington 99164.

High sulfur coals contain significant quantities of trace metals which may have undesirable effects on liquefaction processes, on upgrading of derived syncrudes, or on the environment. A study of the fate of up to 35 trace elements in the SRC I and SRC II processes by neutron activation analysis (NAA) and atomic absorption spectroscopy (AAS) shows that significant emissions of toxic elements from the Fort Lewis, Washington 50 ton per day pilot plant (operated by Pittsburg & Midway Coal Mining Co.) occur and that, except for Hg in the SRC II process satisfactory material balances can be obtained for SRC I and SRC II processes. In the case of Hg in the SRC II process, and to a lesser extent As, Se and Sb, transport via gaseous streams has been demonstrated and can be related to the volatility and reactions of Hg^0 , HgS , H_2Se , As_4^0 , etc. The NAA and AAS techniques and their application to the complex matrices encountered in coal liquefaction processes are discussed.

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