BIOLOGICALLY IMPORTANT COMPOUNDS IN SYNFUELS PROCESSES*. B. R. Clark, C.-h. Ho, W. H. Griest, and M. R. Guerin. Analytical Chemistry Division, Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee 37830.

Crude products, by-products and wastes from synfuel processes contain a broad spectrum of chemical compounds--many of which are active in biological systems. Discerning which compound classes are most important is necessary in order to establish effective control over release or exposure. Polycyclic aromatic hydrocarbons (PAH), multi-alkylated PAH, primary aromatic amines and N-heterocyclic PAH are significant contributors to the overall mutagenic activities of a large number of materials examined. Ames test data show that the basic, primary aromatic amine fraction is the most active. PAHs, multi-alkylated PAHs and N-heterocyclic PAHs are all components of the neutral fraction. In nearly all cases, the neutral fractions contribute the largest portion of the mutagenic activity, while the basic primary aromatic amine fractions have the highest specific activity. Neutral fractions are usually the largest (wt%) whereas the total basic fractions are small by comparison; thus, the overall greater contribution of the neutral fraction to the mutagenic activity of most samples. Biologically active constituents are isolated in preparative scale amounts from complex mixtures utilizing combinations of liquid-liquid extraction and various liquid chromatographic column-eluent combinations. Fractions are characterized using a combination of spectroscopic techniques and gas chromatography/mass spectrometry. (*Research sponsored by the Office of Health and Environmental Research, Department of Energy, under contract W-7405-eng-26 with the Union Carbide Corporation.)