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November 7, 1980

TO: Brian Harney and Art Hartstein
FROM: J. Cantor, L. Joseph, and P. Fox
RE: October Monthly Progress Report
The Partitioning of Major, Minor, and Trace Elements
During Simulated In-Situ Oil Shale Retorting
LBID-312

Work progress was slow this month due to scheduled vacations and operating problems with the HPLC-GFAA and capillary GC. These problems have now been resolved and work will resume as normal during November.

ARSENIC SPECIATION STUDIES

Investigation of arsenic species in shale leachates by HPLC-GFAA was continued in October. Possibly anomalous retention times observed previously were to have been studied further, but the instrumentation was inoperative for most of the month due to mechanical problems which have now been resolved. In addition, the performance of the anion exchange column deteriorated sufficiently to warrant replacement. The manufacturer has replaced the column with one that differs slightly from the original but is claimed to perform equivalently; the new column will be evaluated next month.

Theoretical considerations plus a small number of test runs suggest that an alkaline sample matrix of molarity comparable to that of the eluting buffer may have significant effects on retention times in gradient elutions. This would explain apparent anomalies in several chromatograms of shale leachates and standards prepared in an alkaline matrix. This problem will be studied during the coming month. It is of crucial importance, as it directly effects the identification of arsenic species. Our previous data may have to be re-evaluated in light of this finding.

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