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Title
MONTHLY PROGRESS REPORT FOR APRIL. DISTRIBUTION OF As, Cd, Hg, Pb, Sb, AND Se DURING SIMULATED IN-SITU OIL SHALE RETORTING

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May 15, 1981

TO: Pat Fair
FROM: Al Hodgson
RE: Monthly Progress Report for April
   Distribution of As, Cd, Hg, Pb, Sb, and Se During Simulated
   In-Situ Oil Shale Retorting
   LBID-397

TASK 2. ANALYTICAL METHODS FOR GAS SAMPLES

With the air-acetylene burner method for on-line Cd analysis, offgas flow rate measurement and control must be accomplished before the offgas reaches the burner. As previously noted, we experienced difficulty with the method used for sample gas flow rate measurement during retort run LBL-08. The major source of this difficulty was the necessity to interrupt gas flow to the burner in order to make the measurement. During April, we investigated several alternate methods of flow rate determination. One method appears to be suitable. This method is based upon the measurement of pressure drop over a length of capillary tubing. A simple gas flow measuring apparatus was designed using theoretical calculations. Materials were assembled, and the system, utilizing a one meter section of heated 1.5 mm I.D. stainless steel tubing, was constructed. We are currently calibrating the system.

TASK 4. LABORATORY PARTITIONING STUDIES

Experiment LBL-08 produced the first on-line measurements of Cd in retort offgas. However, the offgas Cd results are semi-quantitative due to the flow rate measurement problems. A mass balance is currently being attempted for that experiment in order to evaluate the on-line Cd measurements. Cadmium concentrations in raw and spent shale samples from the experiment have been determined using an acid digestion technique that results in improved analytical precision. These results indicate that 96% of the Cd in the raw shale was volatilized at the 890°C retorting temperature.
Oil and water samples are being analyzed to determine Cd partitioning to these products.

PROJECTED WORK

The two major tasks for May are as follows:
1. Complete the first draft of the report on the results of the Hg partitioning studies.
2. Make preparations for the second retort run for Cd partitioning. This retort run could be conducted in May if the new flow rate measurement system is found to be adequate.
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