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ANCO PROGRESS REPORT

April, 1956

Evaluation of the ANCO System for enriching boron isotopes continues. Information is being gathered by two different methods. Overall performance of the system is being studied in the small scale apparatus which has been set up in the laboratory. Scale-up data and information about reflux operations is being obtained from the large scale Reflux Test Facility. The status of each of these operations follows.

Laboratory Scale ANCO System

After the 15 day run reported last month, the apparatus was cleaned and remodeled by installation of heavy duty microbellows pumps in the anisole and BF_3 complex streams. In addition, a calibration tube was installed in the anisole- BF_3 complex system in order that accurate readings of flow versus time could be made while a run was in progress.

On April 5, the apparatus was started up and a series of tests begun to check total separation as a function of flow rate. Samples from these runs are awaiting mass spectrometer analysis.

Total boron in the decomposer effluent was about 70 ppm, weight basis, after one week of continuous operation.

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After three weeks, the boron present in the anisole had increased to approximately 130 ppm, weight basis. No correlation was found between residence time of the anisole in the decomposer, and the amount of boron in the anisole for residence times between 1 and 7 hours. Corrosion of nickel by the system was shown to be very low; less than 4 ppm nickel was found in the recycled anisole after 3 weeks exposure.

Further runs are planned to study the factors responsible for the boron buildup in the anisole.

Reflux Test Facility

Decomposer heat balance data were collected for the following flows:

<u>Complex Flow Rate (ml/min)</u>	<u>Steam Pressure (psig)</u>
1700	65 70
1800	65
1856	65

After the above data were obtained, the safety release disc in the system ruptured, releasing to the atmosphere about one-half of the BF_3 in the system, and necessitating a complete shut-down. While the system was shut down, baffles

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and Yorkmesh demister material was installed in the re-combiner to improve the absorption efficiency of that unit. Six thermocouples were installed to provide information on the location of the reaction zone in the recombiner.

A small auxiliary gas cooler, having 3.3 square feet of cooling area, was installed in the gas line between the gas cooler and the exchange column to provide additional cooling for the gas before it is introduced into the exchange column.

The system is now being cleaned and dried. After filling the equipment with freshly distilled anisole and a new supply of BF_3 , heat balance data and complex composition data will be obtained for flow rates of 1200, 1300, and 1400 ml of complex per minute at 65, 70, and 75 psig steam pressure.

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