

## Summary of Session 5B

Chairman: Mr. M. Hugon

Five posters were presented by Japanese research institutions in this session. Three subjects were treated: (i) liquid-liquid extraction, by JAERI (two posters); (ii) dry reprocessing, by PNC (two posters); and (iii) photochemistry, by PNC (one poster).

JAERI presented the PARC (Partitioning Conundrum Key) process concept. This concept was developed by using the Back-End Cycle Key Elements Research Facility (BECKY) in NUCEF. Simplification of the chemical process and enhancement of the separation efficiency and of the confinement capability of long-lived nuclides were key parameters in improving economical competitiveness and safety standards.

The subject of the second poster was a presentation of the Partitioning Test Facility built in NUCEF in order to test the 4-group partitioning process developed by JAERI with real HLLW. Two to twenty liters of HLLW (5 000 Ci at maximum) can be treated during each experiment. Partitioning tests with simulated HLLW had already been started.

Recovery of valuable metals from spent nuclear fuel by lead extraction from high-level radioactive waste was investigated by PNC. Ruthenium was selectively separated by ozone oxidation. Different methods such as solvent extraction, precipitation and ion exchange were studied for the selective separation of rhodium and palladium. A process to recover technetium would be developed at a later stage.

A very high temperature method was being developed by PNC to separate platinum group metals from the actinide and rare earth elements. Titanium nitride was mixed with calcinated HLLW. The oxides of the platinum group elements were reduced into a metallic phase and partitioned from the oxide phase containing the actinides and rare earths at 1 600 degrees C.

In the last poster, PNC presented an application of photochemical techniques for the separation and co-extraction of neptunium from/with plutonium in a mixed nitric acid solution. The solution was irradiated by a high-pressure mercury lamp, which led to a valence adjustment of neptunium and plutonium, and, then, to a substantial improvement of their co-extraction in the organic phase. The photochemical dissolution of  $UO_2$  powder in a nitric acid solution, at room temperature, appeared also to have much potential.