# ID 80

## Fast microfluidic extraction of Sg homologues at new joint CTU, UiO and NPI facility in Rez (CZE)

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Recently, a new experimental facility was set up at the U-120M cyclotron at the Nuclear Physics Institute of the Czech Academy of Sciences in Rez (CZE) within its CANAM infrastructure. It is equipped with target chamber and gas-jet (GJ) transfer system from the University of Oslo (NOR), and microfluidic liquid-liquid extraction (LLX) system from the Czech Technical University in Prague (CZE) that has been installed in a new chemical laboratory. Now, options for fast aerosol into liquid flow conversion are under development. Combining all these systems should constitute a platform for fast transport and fast low-reagent-consumption liquid chemistry studies of on-site produced short-lived radionuclides.

In this work, recent results of microfluidic liquid-liquid extraction of Mo and W (as homologues of Sg) from diluted nitric acid into Cyanex®600 in 1% n-octanol and kerosene will be discussed. First, microfluidic slug-flow capillary technique and vortex batch technique will be compared showing enhanced mass transfer properties in favor of microfluidics. In parallel, choice of Cyanex®600 as a group 6 fast extracting agent will be justified by comparison with widely used HDEHP extractant. Consequently, dependencies of Mo/W equilibrium distribution ratio on pH, nitrate concentration and Cyanex®600 concentration will be shown. Based on the slope analyses of such dependencies, mechanism of Mo/W extraction in the Cyanex®600/nitric acid system will be proposed. In the end, retention time, as one of the ultimate parameters for short-lived-radionuclide extraction, will be discussed with respect to the system in question and its possible optimization.

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