

# Separation of $^{235}\text{U}$ , $^{238}\text{U}$ and Thorium from Mixed Rare Earth using Ion Exchange Resin

ช่วงเวลาดำเนินการ ปี พ.ศ. 2559 - 2560

ผู้รับผิดชอบ กัลยา ช่างเครื่อง ตำแหน่ง นักนิวเคลียร์เคมีชำนาญการ

ผู้ร่วมงาน เสาวลักษณ์ ทองอินทร์ และ หริเนตร มุ่งพยาบาล

Email: Kalaya.c@oap.go.th

## รายละเอียดสรุป

Uranium isotope and thorium were separated in nitric acid form by using ion exchange column-resin. This experiment was tested in batches. Feed was prepared from uranium, thorium, and rare earth elements (REE) in 80 ppb concentrations. Three types of Dowex-50 cation exchange resins (x2, x4, and x8) were used in this experiment for uranium isotope and thorium separation. Three nitric acid concentrations (1 M, 2 M, and 3 M) were used to elute the uranium isotope, while thorium was eluted by 6 M, 7 M, and 8 M of Nitric acid. The results show that 1 M  $\text{HNO}_3$  and 7 M  $\text{HNO}_3$  were appropriate conditions for uranium and thorium separation respectively. In this study, the optimum extraction resin of uranium was x4 Dowex-50 and thorium in rare earth mixture was x2 Dowex-50. Uranium isotopes, thorium, and other REE concentrations were determined by inductively coupled plasma–mass spectrometry (ICP-MS). Furthermore, this work was used to study the problem of matrix effects of high counting signal from each element which could be interfered with the signal of low-concentration elements in sample mixture.

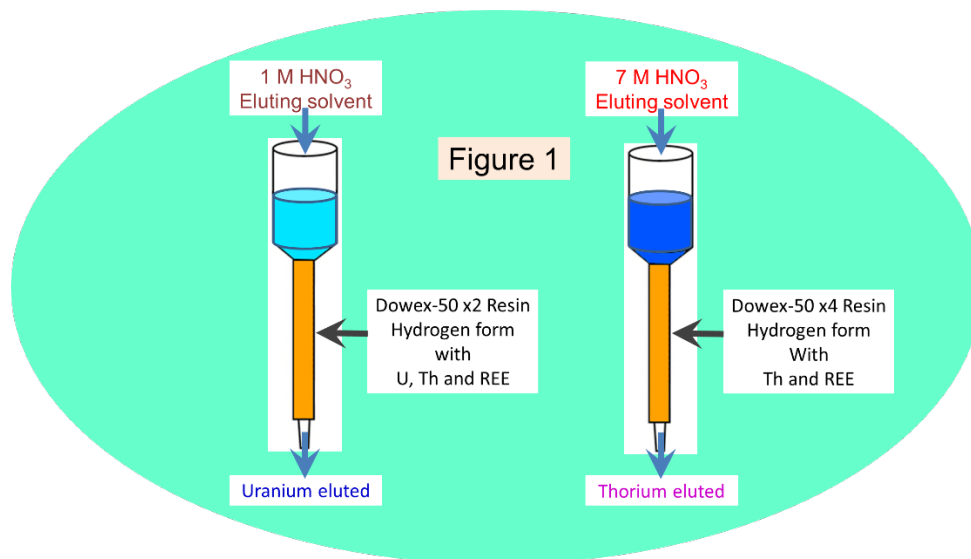


Fig.1.schematic of column separations