

Summary of Method Pertechnetate, Tc(VII), is removed from dilute acid solution with WBEC Resin. The WBEC resin contains a tertiary amine extractant (Alamine 336) on an inert polymeric support. The Alamine 336 acts as an anion exchanger when protonated in dilute acidic media. However, from basic media, the Alamine 336 is deprotonated and no longer acts as an anion exchanger. This behavior allows anions, such as pertechnetate to be efficiently stripped from the WBEC resin using 1M NH₄OH, whereas a quaternary amine, such as Aliquat 336 (TEVA) will continue to act as an anion exchanger from basic media and requires 8-10 M HNO₃ to strip pertechnetate.

Reagents

WBEC Bulk Resin (WB-B25-S)

Nitric Acid (70%)

Hydrogen Peroxide (30% H₂O₂)

Ammonium Hydroxide (56%)

Tc Separation on WBEC Resin

(1) Add 1-2 mL 30% H₂O₂ per 100 mL of sample to ensure Tc(VII). Adjust to 0.01M HNO₃. Mix well.

(2) Precondition WBEC column with 3 bed volumes of 0.01M HNO₃.

(3) Load Sample.

(4) Rinse column with 10 bed volumes of 0.01M HNO₃.

(5) Strip Tc with 5 bed volumes of 1M NH₄OH.



Equipment

Empty Columns

2 mL snap tip (AC-141-AL)

2 mL cap tip (AC-100-MT-PP)

5 mL (AC-50E-5M)

20 mL (AC-20E-20M)

Column Reservoir

For 2 mL columns (AC-120-TK)

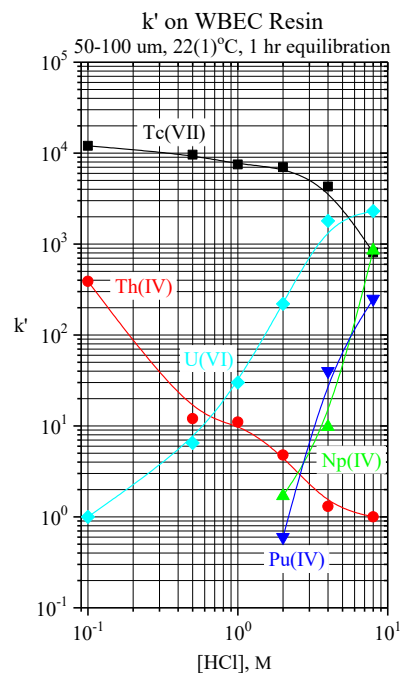
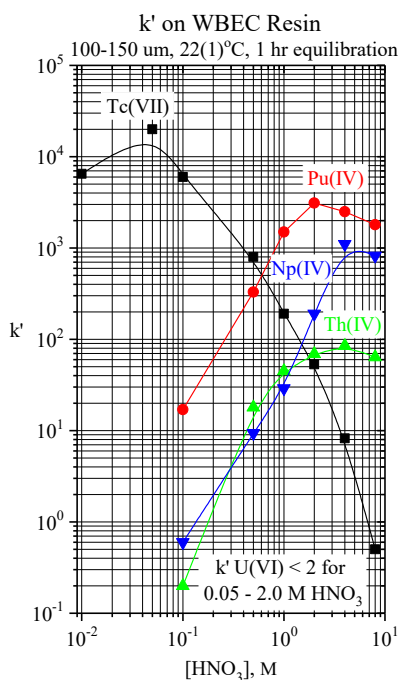
250 mL For 5 and 20 mL columns (AC-20X-20M)

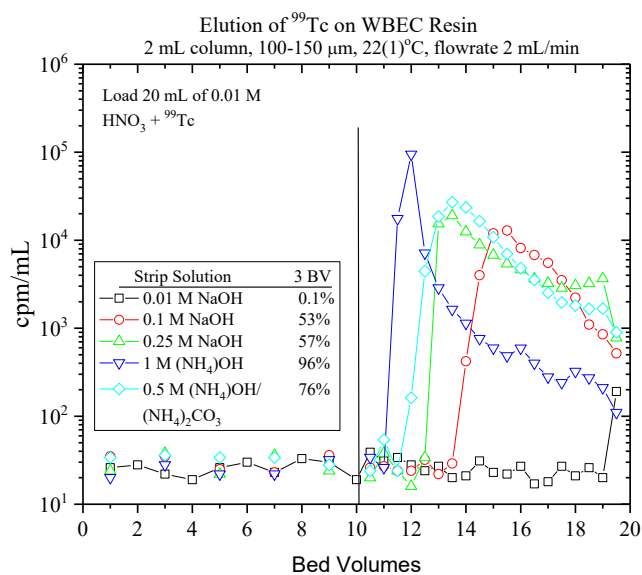
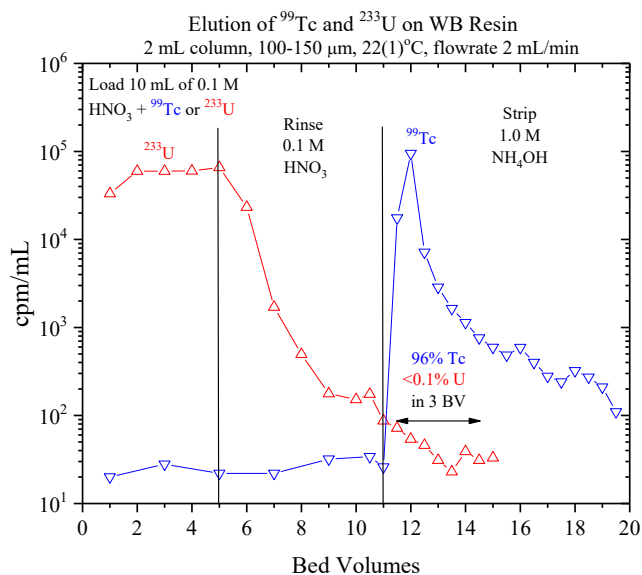
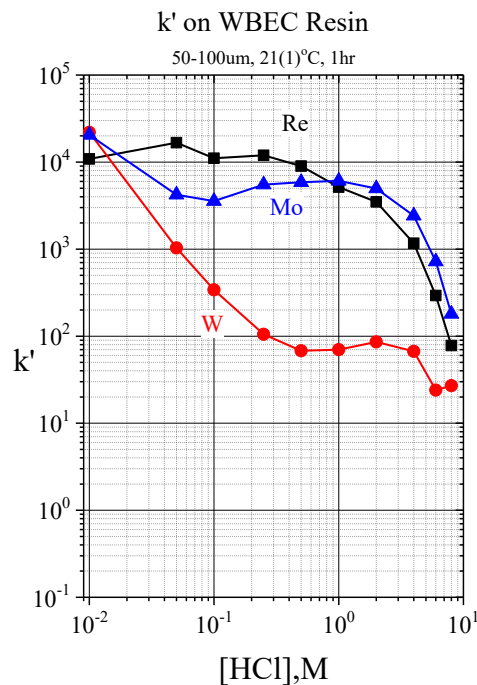
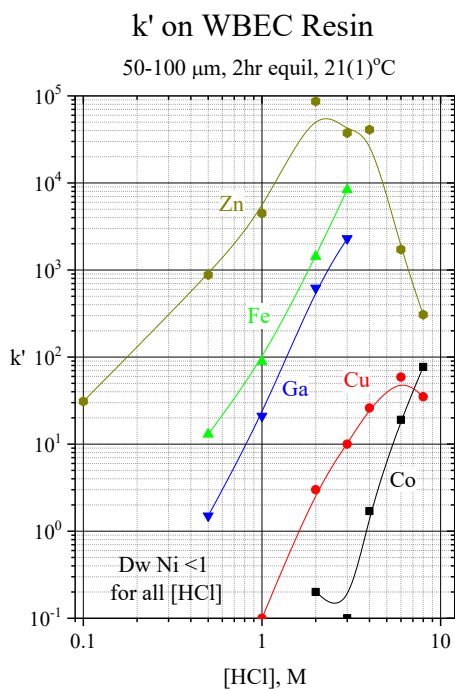
Column Rack

15 hole for 2 mL columns (AC-103)

12 hole for 5 and 20 mL columns (AC-20M-RACK)

50 mL Centrifuge Tubes





References

G.D. Jarvinen, K.M. Long, G.S. Goff, W.H. Runde, E.J. Mausolf, K.R. Czerwinski, F. Poineau, D.R. McAlister, E.P. Horwitz, "Separation of Pertechnetate from Uranium in a Simulated UREX Processing Solution Using Anion Exchange Extraction Chromatography," *Solv. Extr. Ion Exch.*, 31, 416-429, (2013).