Summary of Method  
A method for the preparation of $^{239}\text{Np}$ ($t_{1/2} = 2.355$ days) from $^{243}\text{Am}$ ($t_{1/2} = 7380$ years) source material is presented. The method employs 2mL cartridges of UTEVA and DGA resins to obtain high purity $^{239}\text{Np}$ in small volumes of eluate, while preserving valuable $^{243}\text{Am}$ material. The source material is adjusted to 4M HNO$_3$, treated with iron, sulfamic acid and ascorbic acid to fix the Np(IV) oxidation state, and loaded onto stacked 2mL cartridges of UTEVA and DGA resins. $^{239}\text{Np}$ is retained on UTEVA Resin, while $^{243}\text{Am}$ is retained on DGA Resin. The $^{243}\text{Am}$ source is recovered from DGA Resin with a small volume of 0.5M HCl. Following a suitable ingrowth period, the $^{243}\text{Am}$ can be acidified to 4M HNO$_3$ and used to produce additional $^{239}\text{Np}$. The $^{243}\text{Am}$ is preserved nearly indefinitely and continuously purified from chemical and radiologic impurities run to run. $^{239}\text{Np}$ is recovered from UTEVA resin with 0.5M HCl.

Reagents
UTEVA Cartridges (Eichrom UT-R50-S)
DGA Cartridges (Eichrom DN-R50-S)
$^{243}\text{Am}$ Source
Deionized Water
HCl
HNO$_3$
Sulfamic Acid
Fe carrier (10mg/mL)
Ascorbic Acid

Equipment
Glass vials for storage of $^{243}\text{Am}$.
Glass or plastic vials/bottles for collection of $^{239}\text{Np}$ and waste.
10, 20 or 30mL plastic luer lock syringes
Gamma Spectrometry System for measurement of $^{239}\text{Np}$ and $^{243}\text{Am}$.
**References**