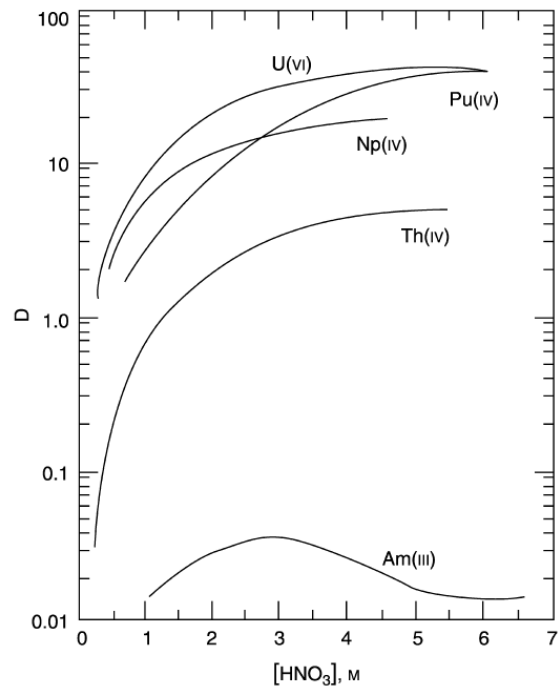


PDF Quiz 9: Separations
 RDCH 702
 Assigned: 7-Nov-18
 Due: 24-Nov-18

Last Name: _____
 First Name: _____

1. Based on the figure below, provide the expected distribution coefficient for metal ions and nitric acid conditions shown in the table below.

Metal Ion	[HNO ₃] M	K _d
UO ₂ ²⁺	3.5	_____
UO ₂ ²⁺	0.5	_____
Pu ⁴⁺	3.5	_____
Pu ⁴⁺	1.0	_____
Np ⁴⁺	3.5	_____
Np ⁴⁺	0.5	_____
Am ³⁺	3.5	_____



2. Select the route and methods used for Pu separation in an example PUREX process

- Formation of volatile actinides with selective removal of Pu
- Sorption of U and Pu to and ion exchange column, column rinse, followed by Pu reduction
- Extraction of UO₂²⁺ and Pu into 30 % TBP, rinse of organic phase with 3.5 M HNO₃, reduction of Pu to Pu³⁺ and backextraction of Pu³⁺ into 3.5 M HNO₃
- Oxidative dissolution of fuel in molten salt. Selective reduction of Pu to the metallic state on an electrode

 Digital Signature