Supplementary Information

Liquid-liquid extraction in flow of the radioisotope titanium-45 for positron emission tomography applications

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Figure S1. The calculated interfacial tension between the aqueous conc. hydrochloric acid phase and the guaiacol-anisole phase as a function of anisole vol. %. The calculations were performed with COSMOthermX at TZVPD-FINE level using $HCl(H_2O)_4$ cluster (inset) as a model for conc. aqueous HCl.
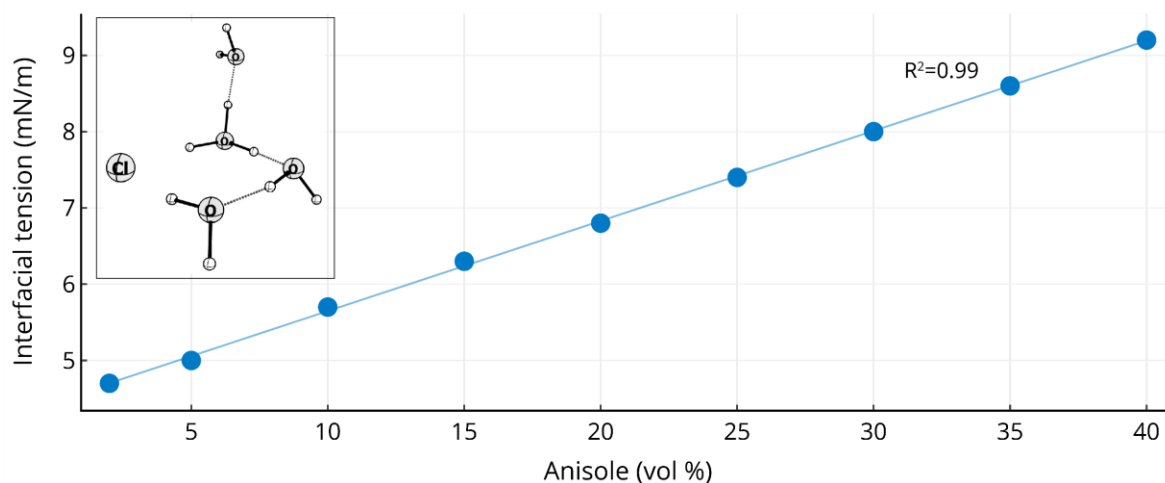
Table S1. Aqueous (aq) to organic (org) flow rate ratios with corresponding volumetric flow rates (total flow rate = 0.20 mL/min) and extraction of titanium using guaiacol/anisole mixtures.

aq/org flow ratio [-]	aq flow rate [mL/min]	org flow rate [mL/min]	Extraction [%] guaiacol/anisole 75/25, (v/v)	Extraction [%] guaiacol/anisole 90/10, (v/v)
1/1	0.1	0.1	70	-
1/3	0.15	0.05	85	90
1/5	0.17	0.03	-	90

Table S2. Separation performance for various membrane pore sizes and diaphragm thicknesses for 37% HCl mixed with either 1-octanol or 1:1 guaiacol/anisole.

Membrane Pore Size [µm]	Diaphragm Thickness [in.]	Performance
37% HCl and 1-octanol		
0.5	0.005	Breakthrough
	0.002	Breakthrough
	0.001	Breakthrough
0.2	0.001	Breakthrough
0.1	0.001	Retention/Breakthrough
37% HCl and 1:1 Guaiacol/Anisole		
0.5	0.005	Breakthrough
	0.002	Breakthrough
	0.001	Retention
0.2	0.002	Complete Separation