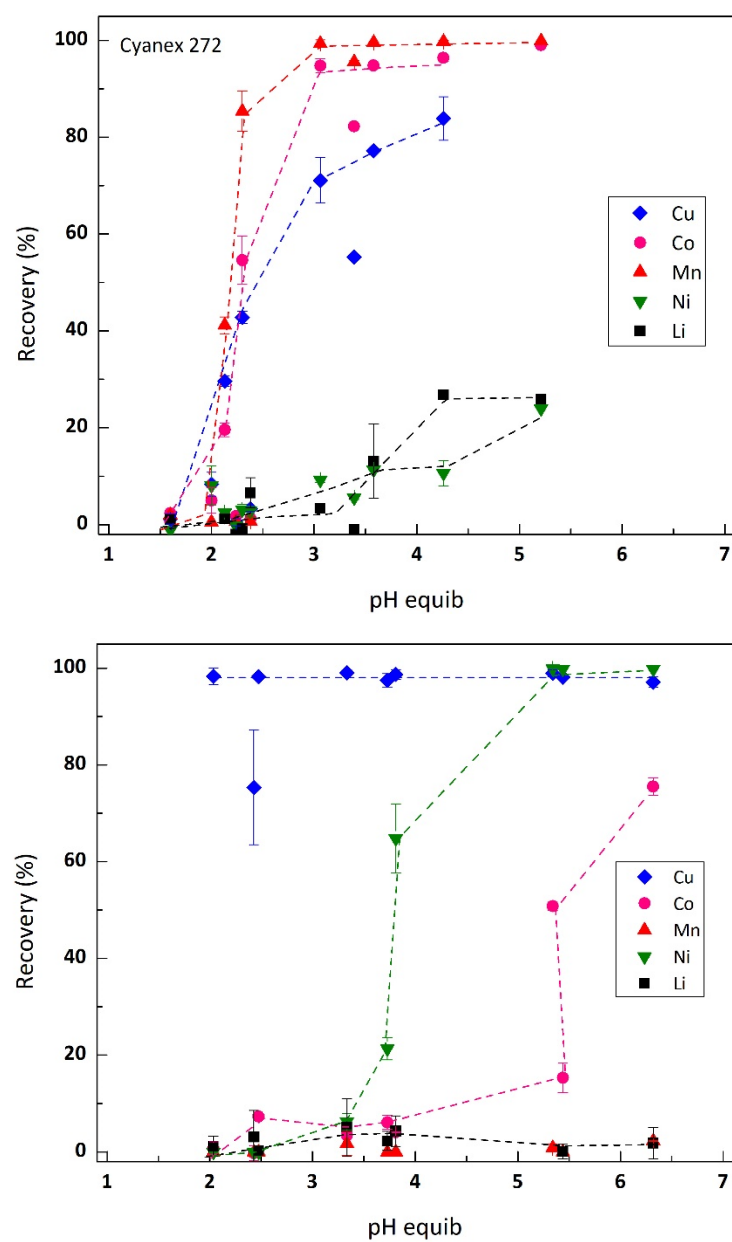
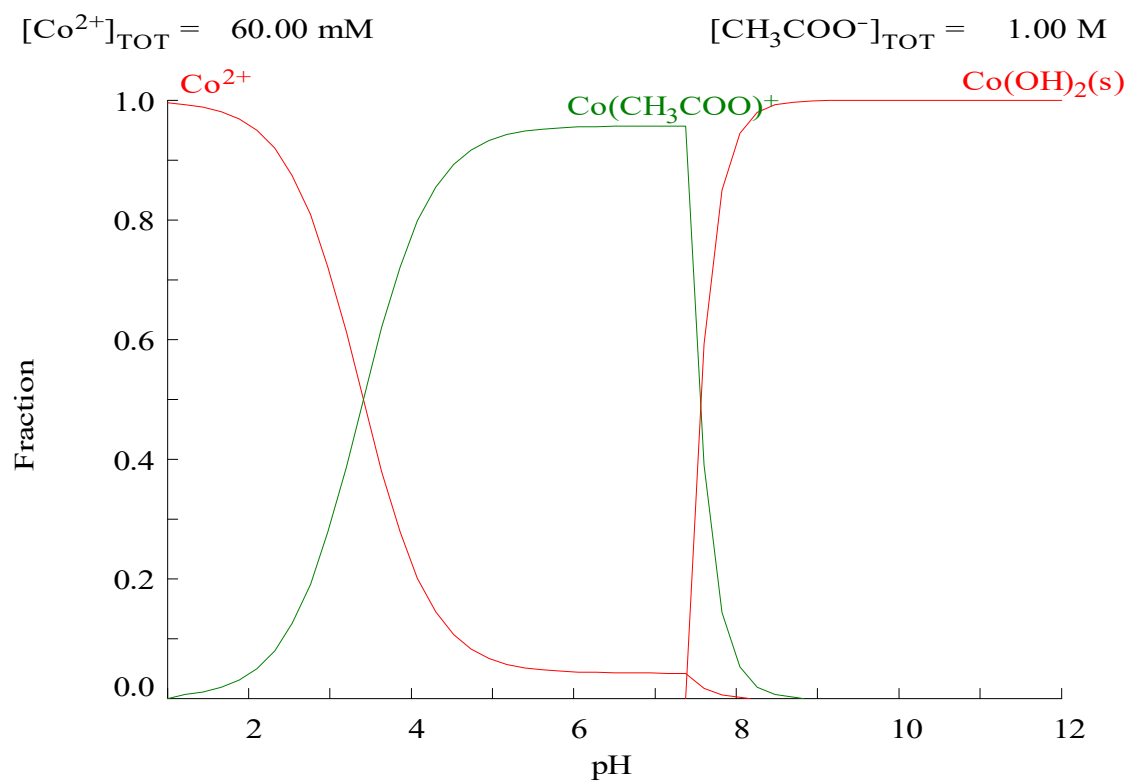
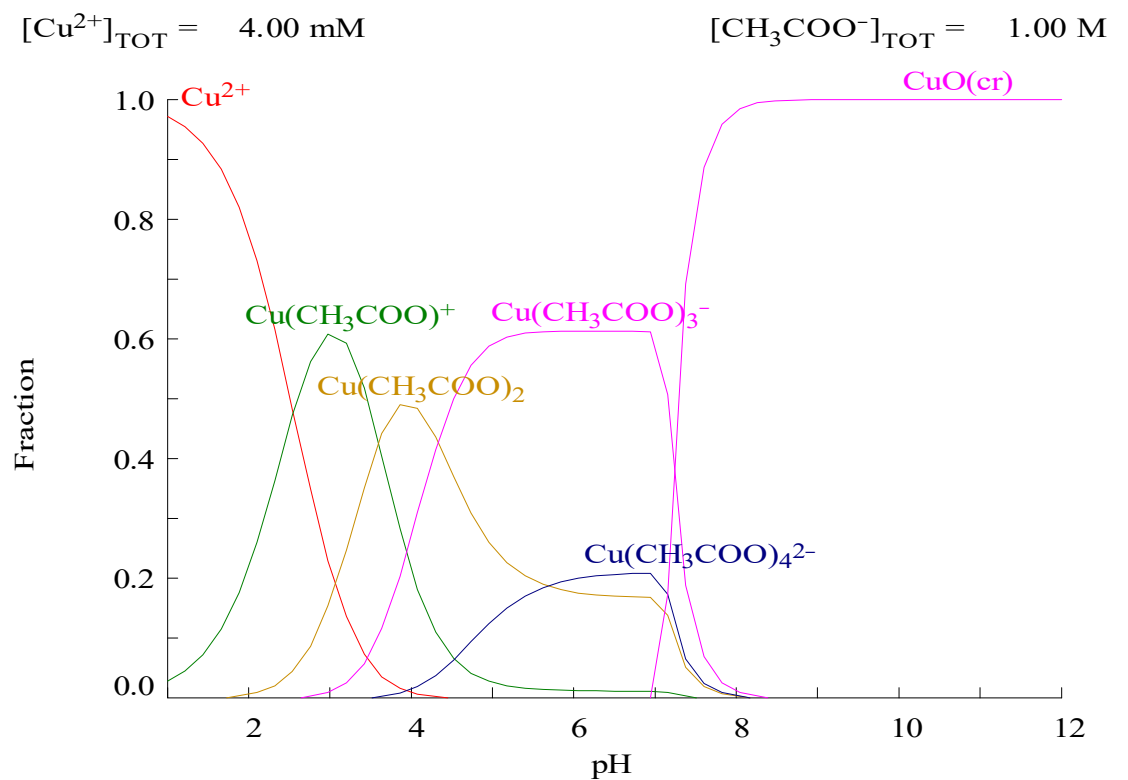


**Figure S1.** Plot between equilibrium pH and metal recovery using Cyanex® 272 and LIX® 84-I (extractant concentration 10% v/v in kerosene, A/O 1)

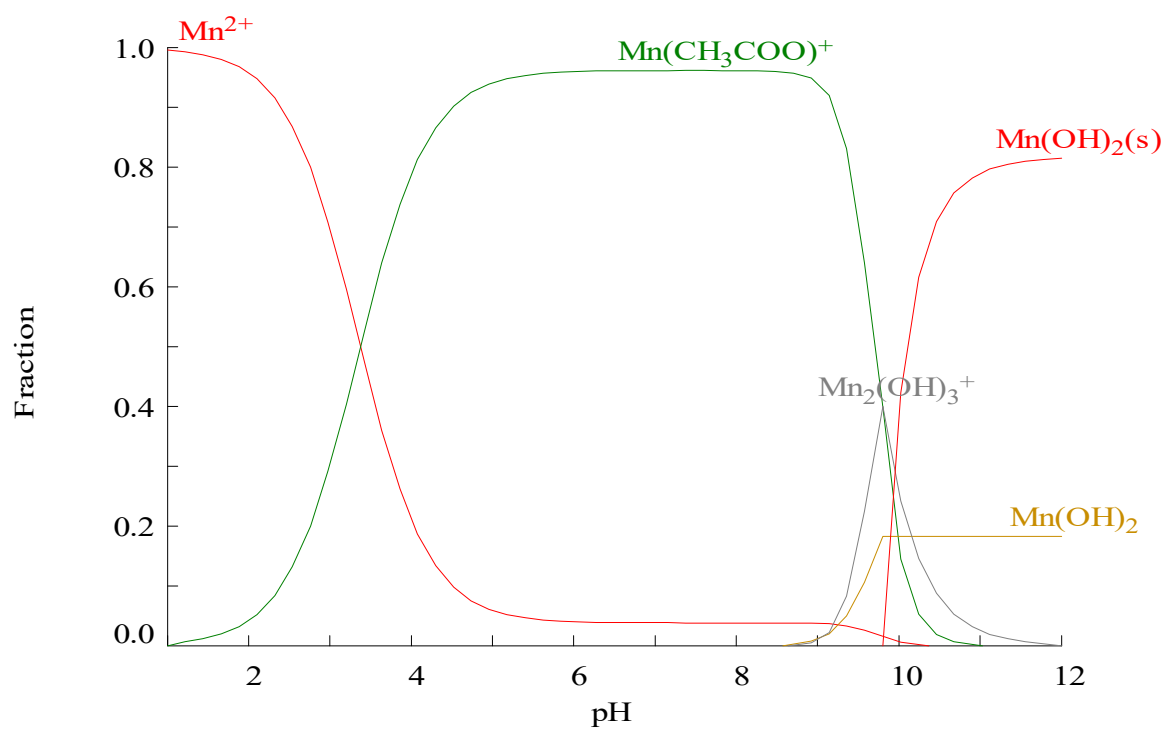


**Figure S2.** Cu, Co, Mn, Ni speciation in acetate media



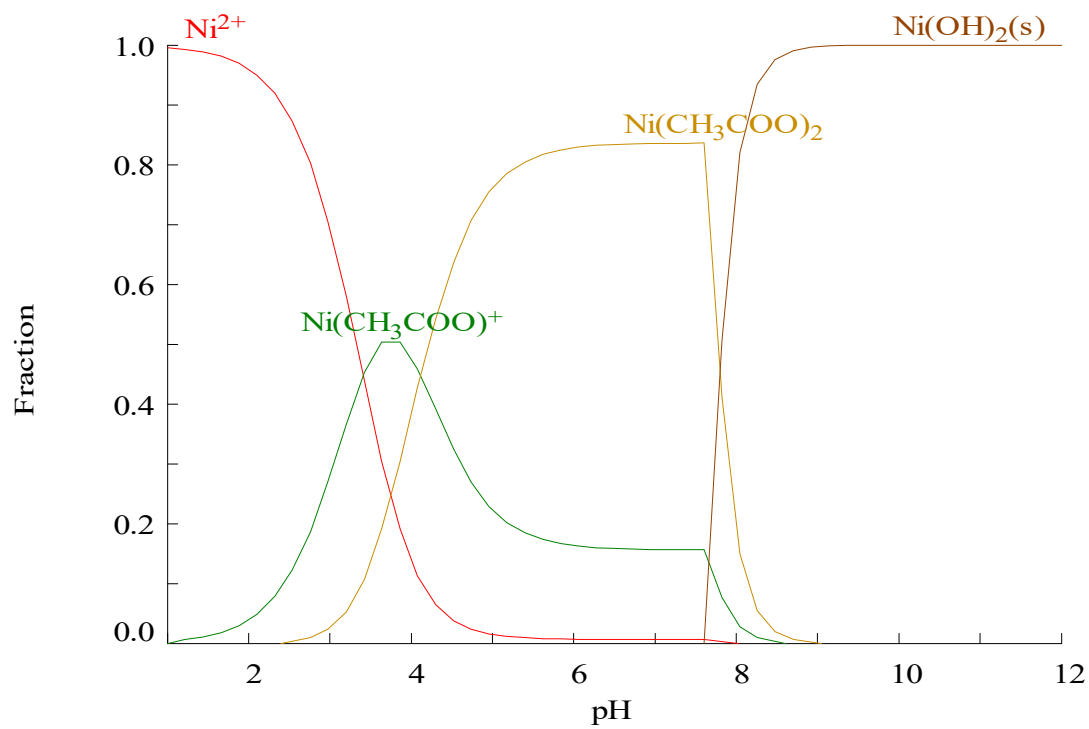
$[\text{Mn}^{2+}]_{\text{TOT}} = 2.50 \text{ mM}$

$[\text{CH}_3\text{COO}^-]_{\text{TOT}} = 1.00 \text{ M}$



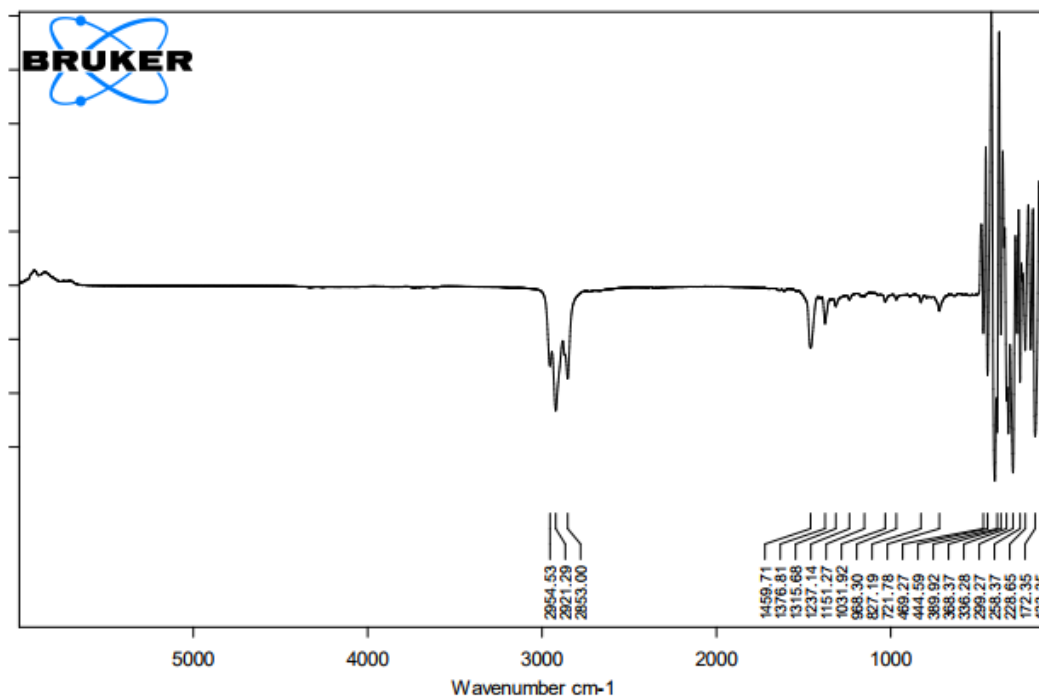
$[\text{Ni}^{2+}]_{\text{TOT}} = 2.20 \text{ mM}$

$[\text{CH}_3\text{COO}^-]_{\text{TOT}} = 1.00 \text{ M}$

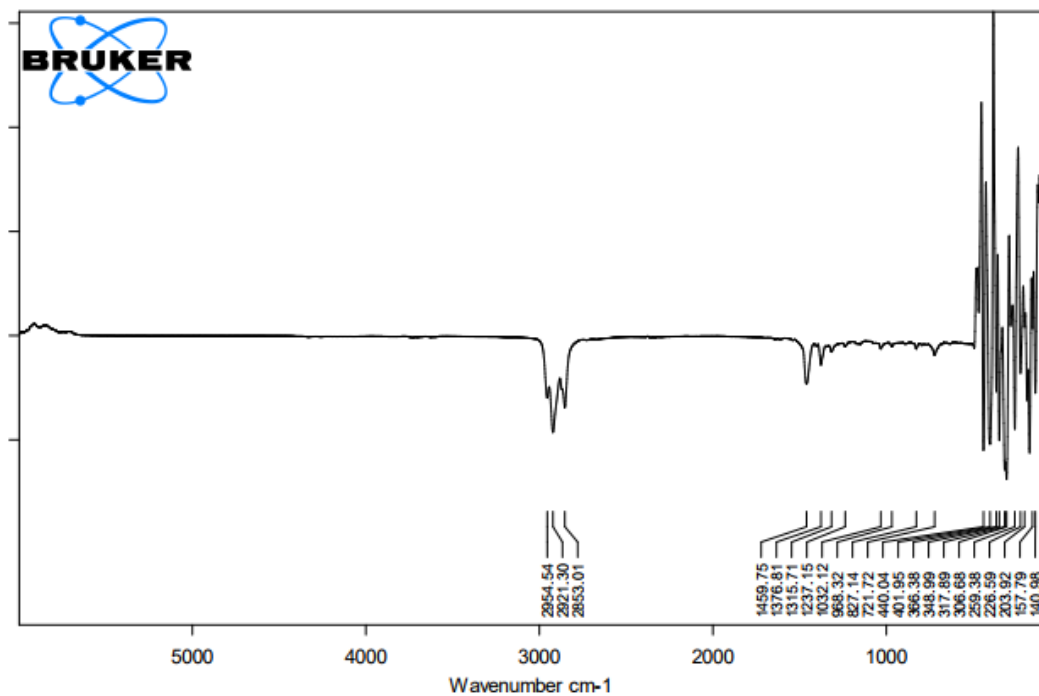


**Figure S3. FT-IR**

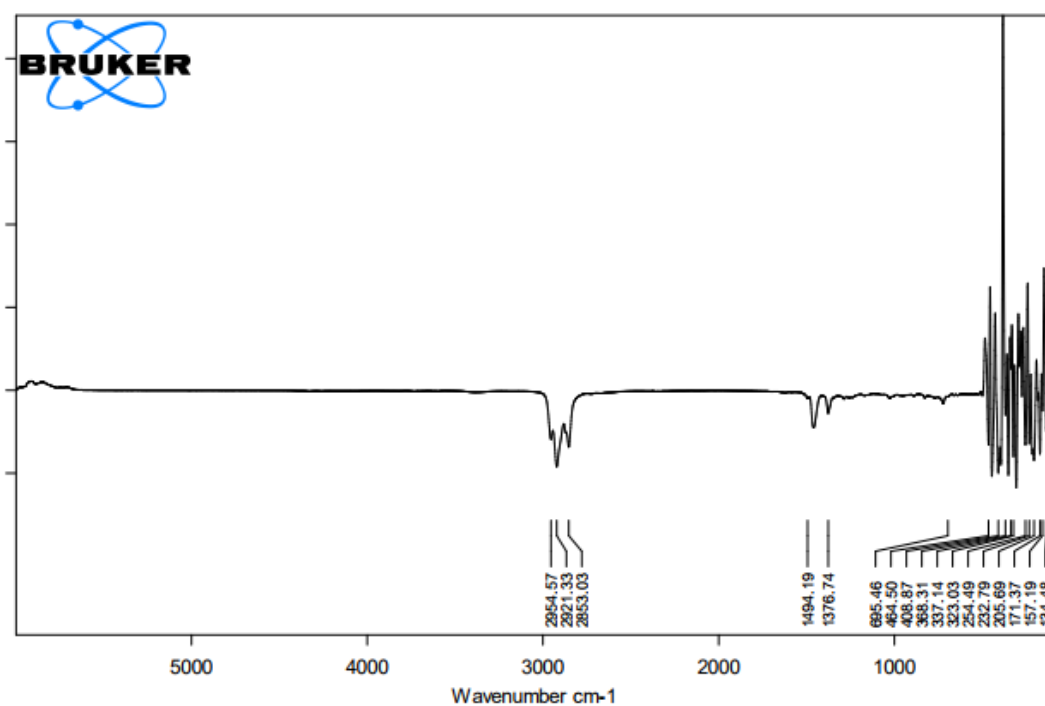
Cu extraction by oxime from non-acetate media



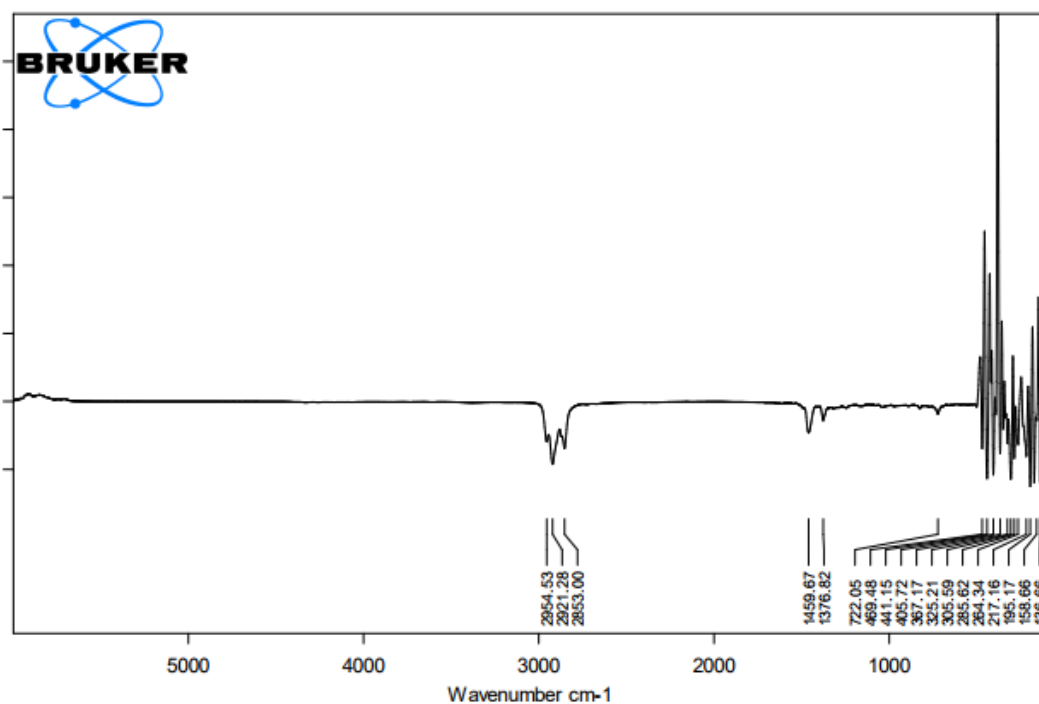
Cu extraction from acetate media



Ni extraction by oxime from non-acetate media



Ni extraction from acetate media



**Figure S4.** Hydra and Medusa modelling for species distribution of Co and Mn in oxalate media.

