Electronic Supplementary Material (ESI) for Dalton Transactions.

Electronic Supplementary Information

Speciation of indium(III) chloro complexes in the solvent extraction process from chloride aqueous solutions to ionic liquids

Clio Deferm, Bieke Onghena, Tom Vander Hoogerstraete, Dipanjan Banerjee, Jan Luyten, Harald Oosterhof, Jan Fransaer and Koen Binnemans*

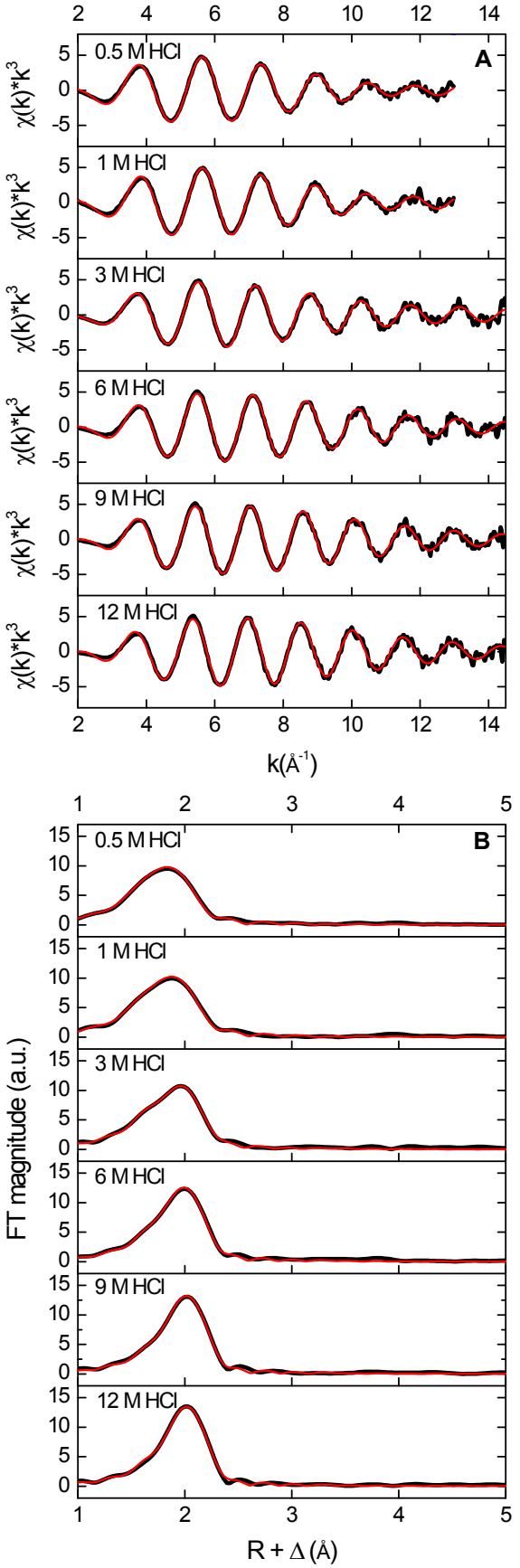

Fig. S1 Indium K-edge k^3-weighted EXAFS spectra (A) and the corresponding FTs (B) for the indium(III) complexes in aqueous solutions as a function of the HCl concentration (5 g L^{-1} indium). Experimental data (black) and theoretical fit (red) are shown.

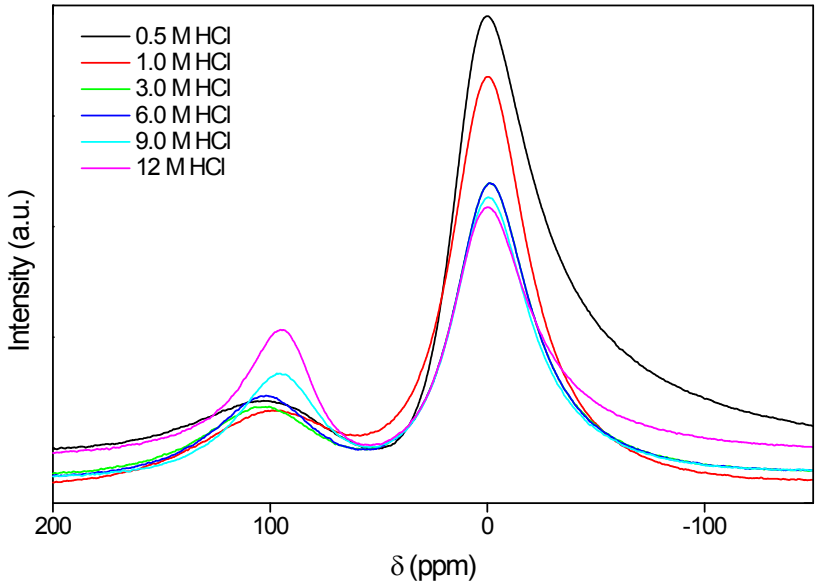

Fig. S2 ^{115}In NMR spectra of the aqueous phase before extraction at 60 °C containing 5 g L^{-1} indium(III) and varying HCl concentration: 0.5 M (–), 1 M (–), 3 M (–), 6 M (–), 9 M (–) and 12 M (–).

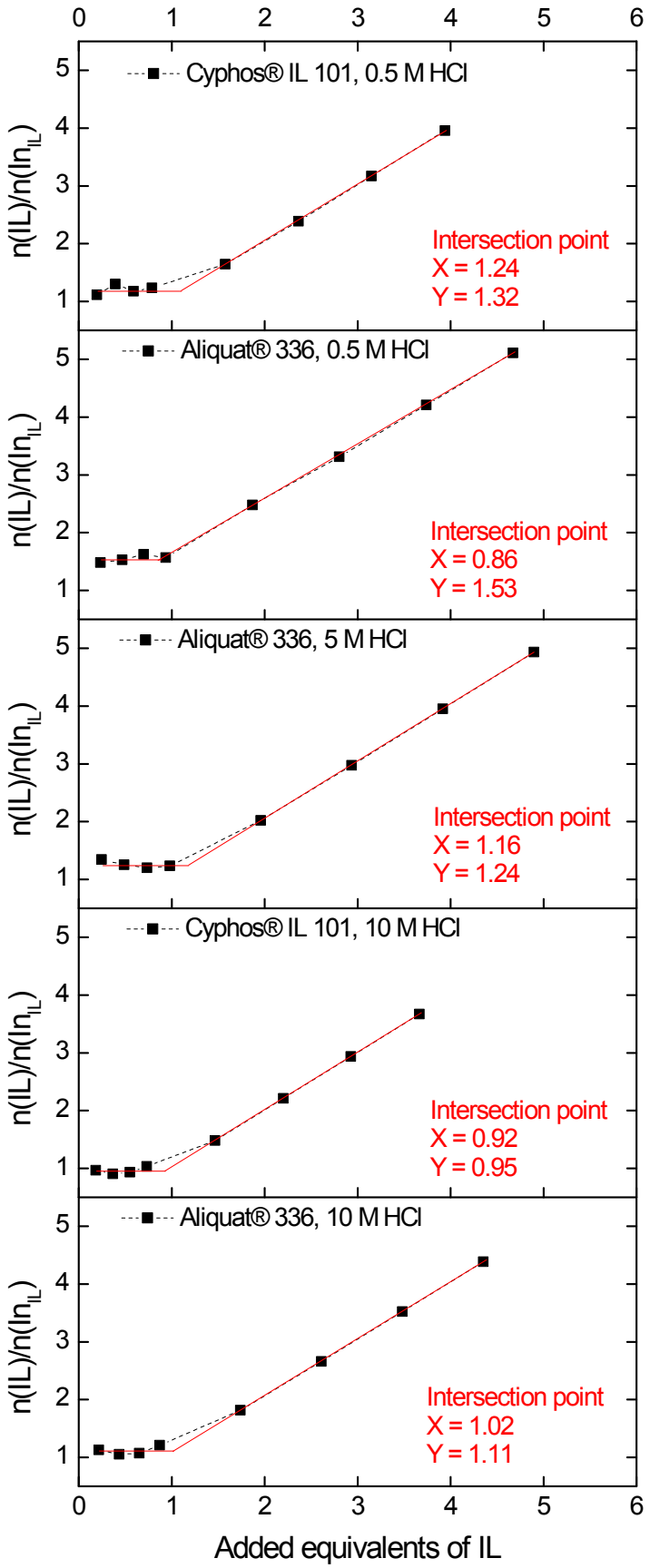

Fig. S3 Number of moles of ionic liquid over the number of moles of extracted indium ($n(IL)/n(In_{IL})$) as a function of the number of ionic liquid equivalents added, at constant initial metal concentrations of indium and 60 °C. Aqueous phase: initial indium(III) concentration of 50 g L^{-1}.

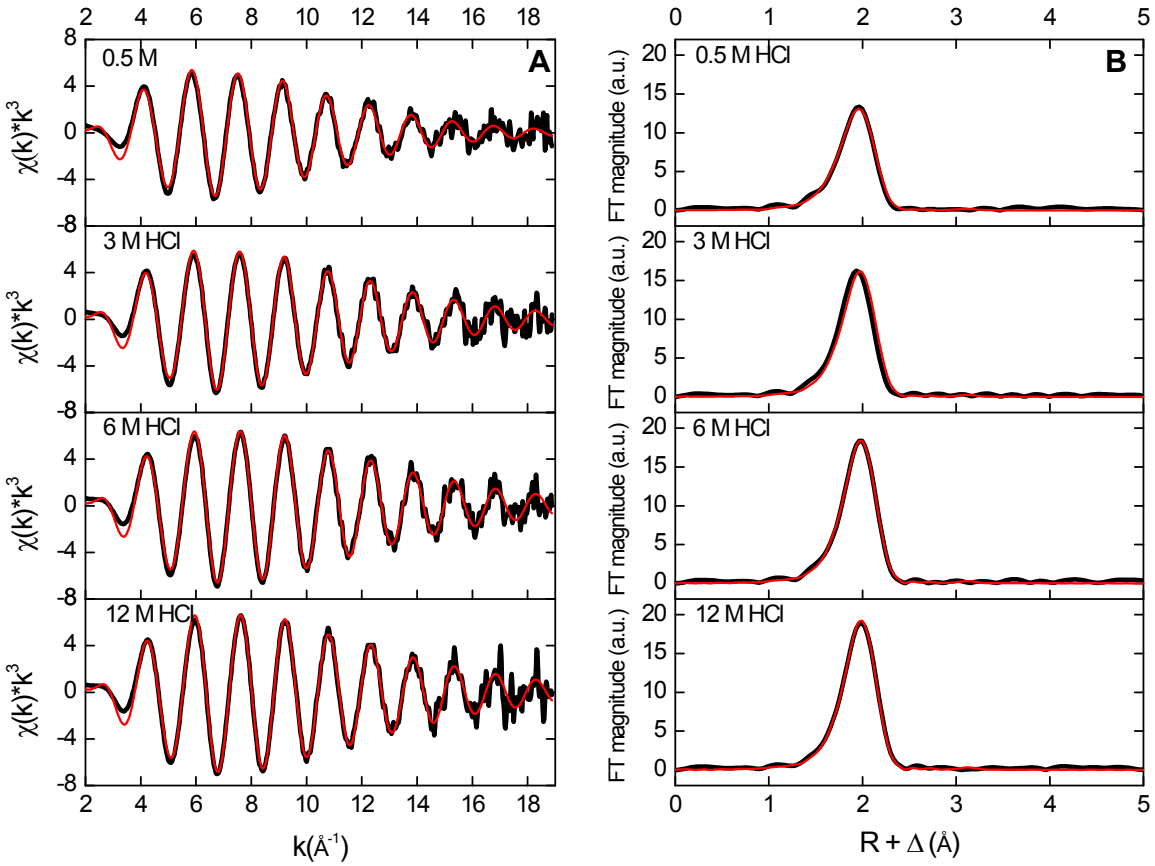

Fig. S4 Indium K-edge k^3-weighted EXAFS spectra (A) and the corresponding FTs (B) for the indium(III) complexes in Aliquat® 336 as a function of the HCl concentration. IL phase obtained after extraction containing 5 g L^{-1} indium. Experimental data (black) and theoretical fit (red) are shown.

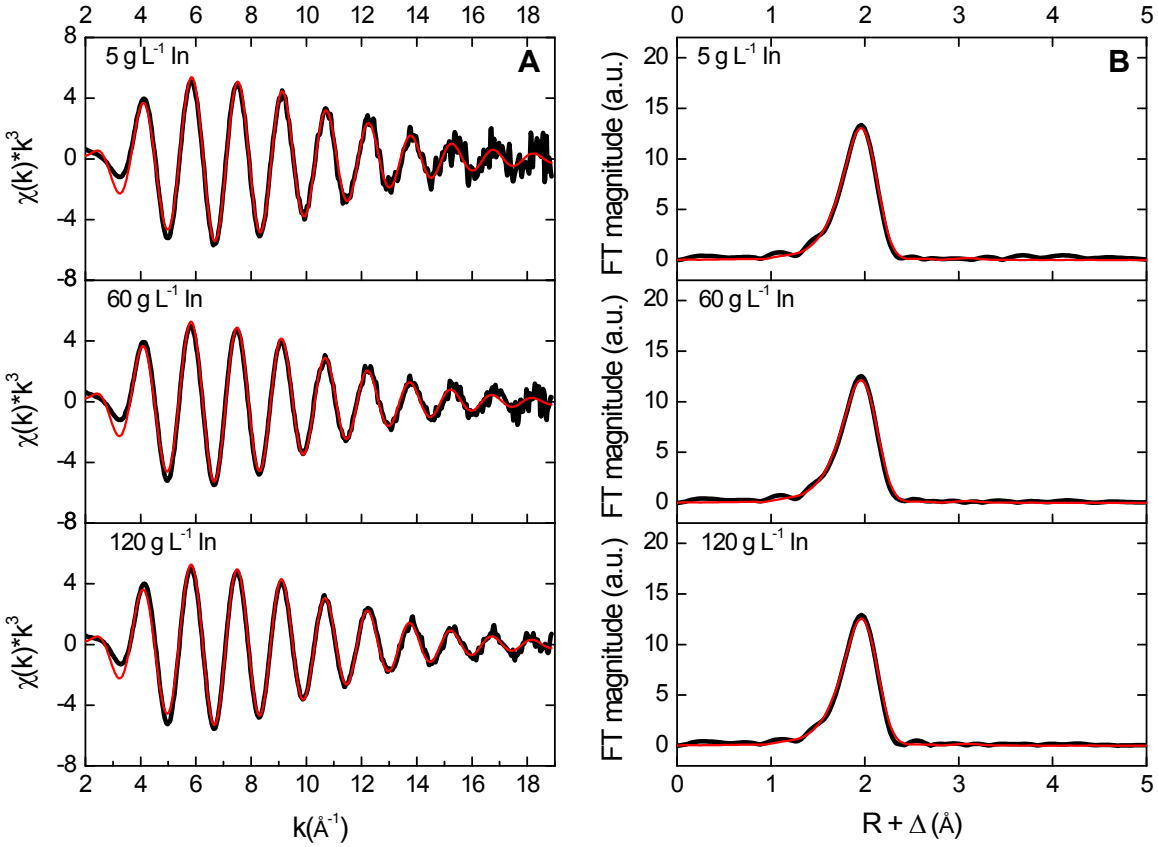

Fig. S5 Indium K-edge k^3-weighted EXAFS spectra (A) and the corresponding FTs (B) for the indium(III) complexes in Aliquat® 336 as a function of the indium concentration. IL phase obtained after extraction containing 0.5 M HCl. Experimental data (black) and theoretical fit (red) are shown.

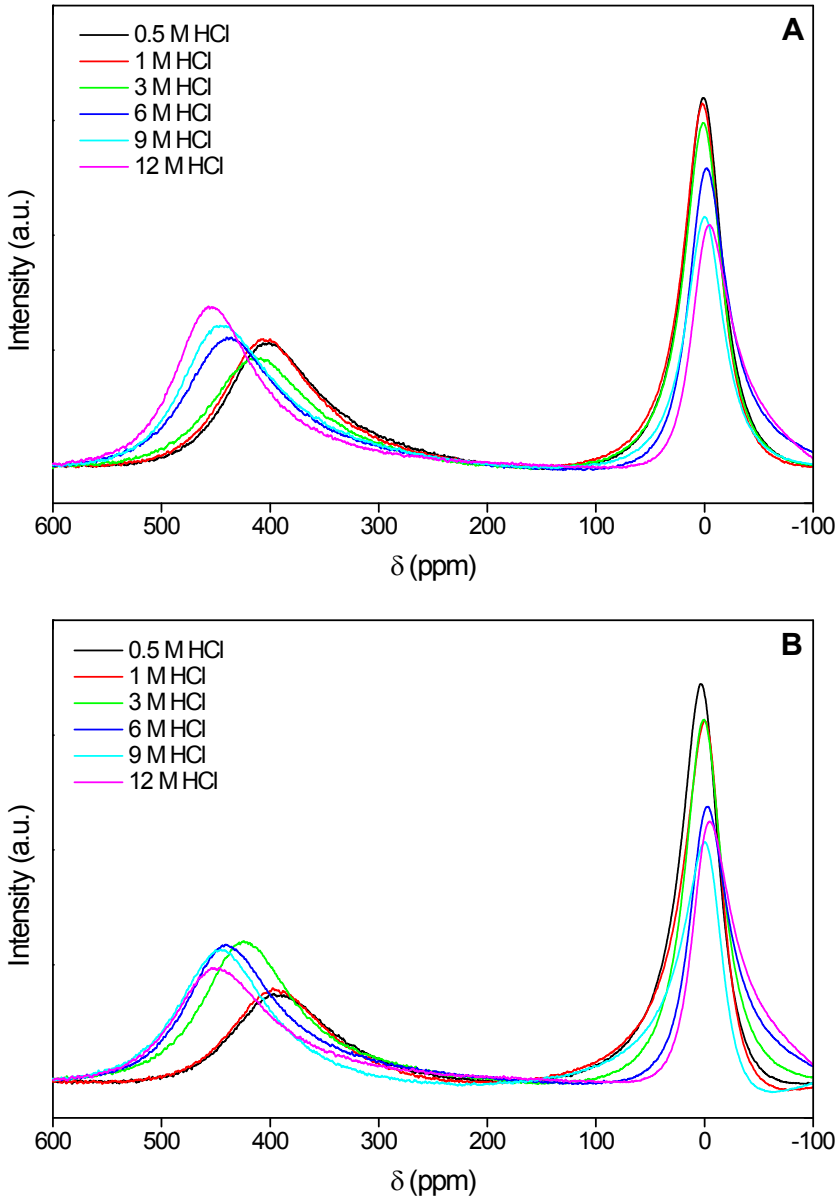

Fig. S5 ^{115}In NMR spectra of the $InCl_3$–Cyphos® IL 101 (A) and $InCl_3$–Aliquat® 336 system (B) at 60 °C obtained after extraction with 5 g L^{-1} indium(III) and varying HCl concentration: 0.5 M (–), 1 M (–), 3 M (–), 6 M (–), 9 M (–) and 12 M (–).

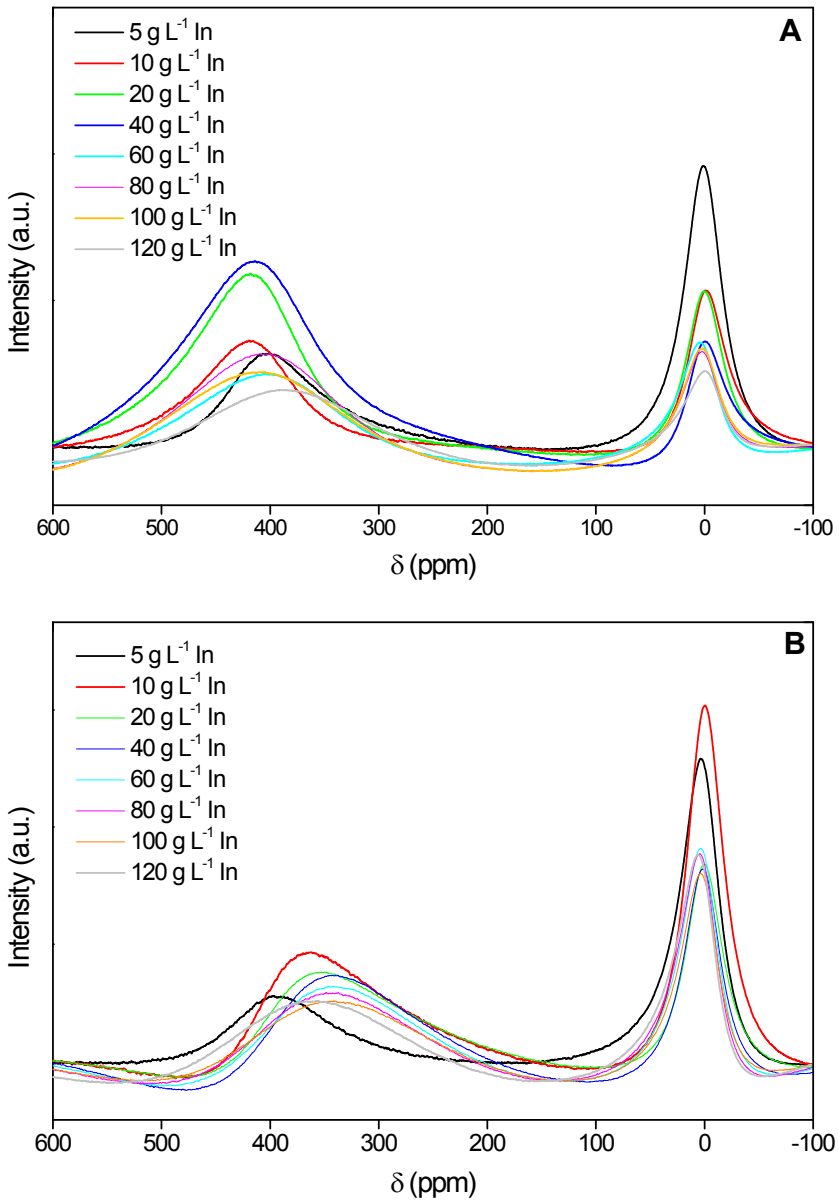

Fig. S6 ^{115}In NMR spectra of the $InCl_3$–Cyphos® IL 101 (A) and $InCl_3$–Aliquat® 336 system (B) at 60 °C obtained after extraction with 0.5 M HCl and varying indium(III) concentration: 5 g L^{-1} (–), 10 g L^{-1} (–), 20 g L^{-1} (–), 40 g L^{-1} (–), 60 g L^{-1} (–), 80 g L^{-1} (–), 100 g L^{-1} (–) and 120 g L^{-1} (–).

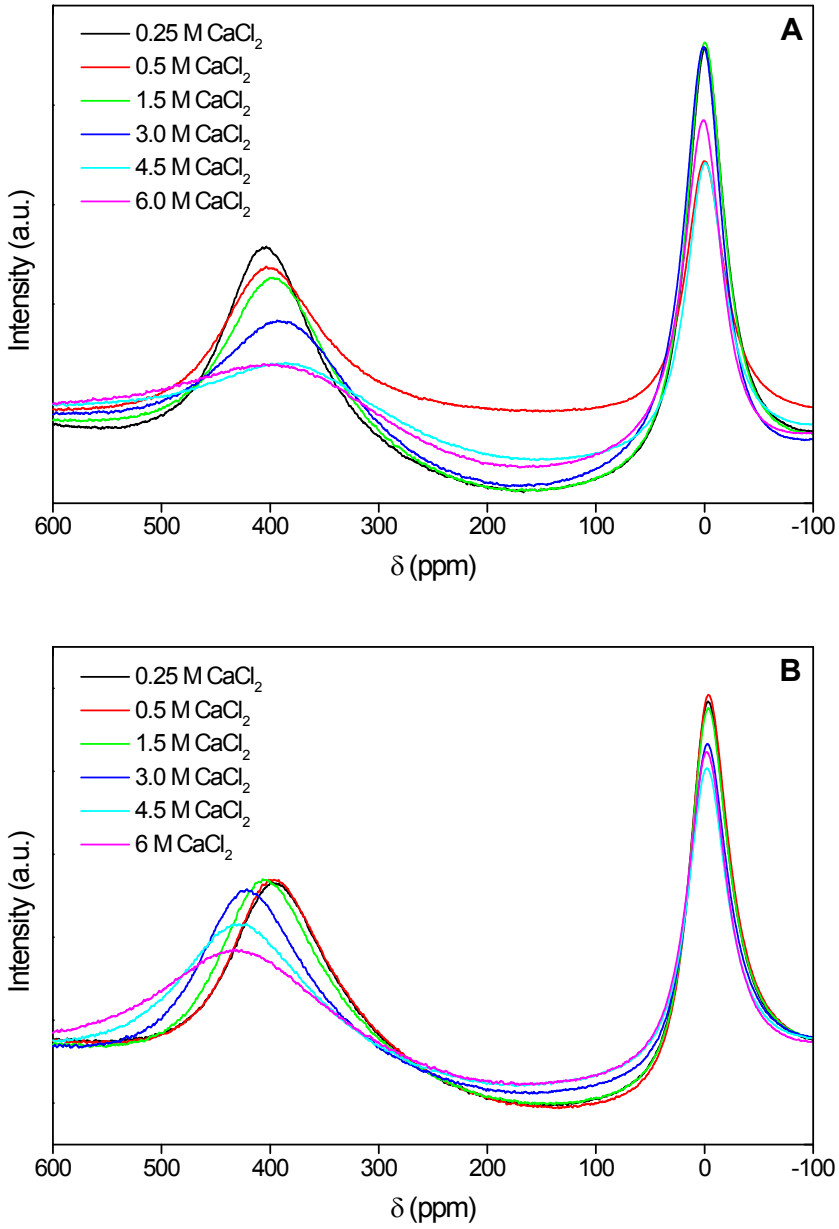

Fig. S6 ^{115}In NMR spectra of the $InCl_3$–Cyphos® IL 101 (A) and $InCl_3$–Aliquat® 336 system (B) at 60 °C obtained after extraction with 5 g L^{-1} indium(III) and varying $CaCl_2$ concentration: 0.25 M (–), 0.5 M (–), 1.5 M (–), 3 M (–), 4.5 M (–) and 6 M (–).