

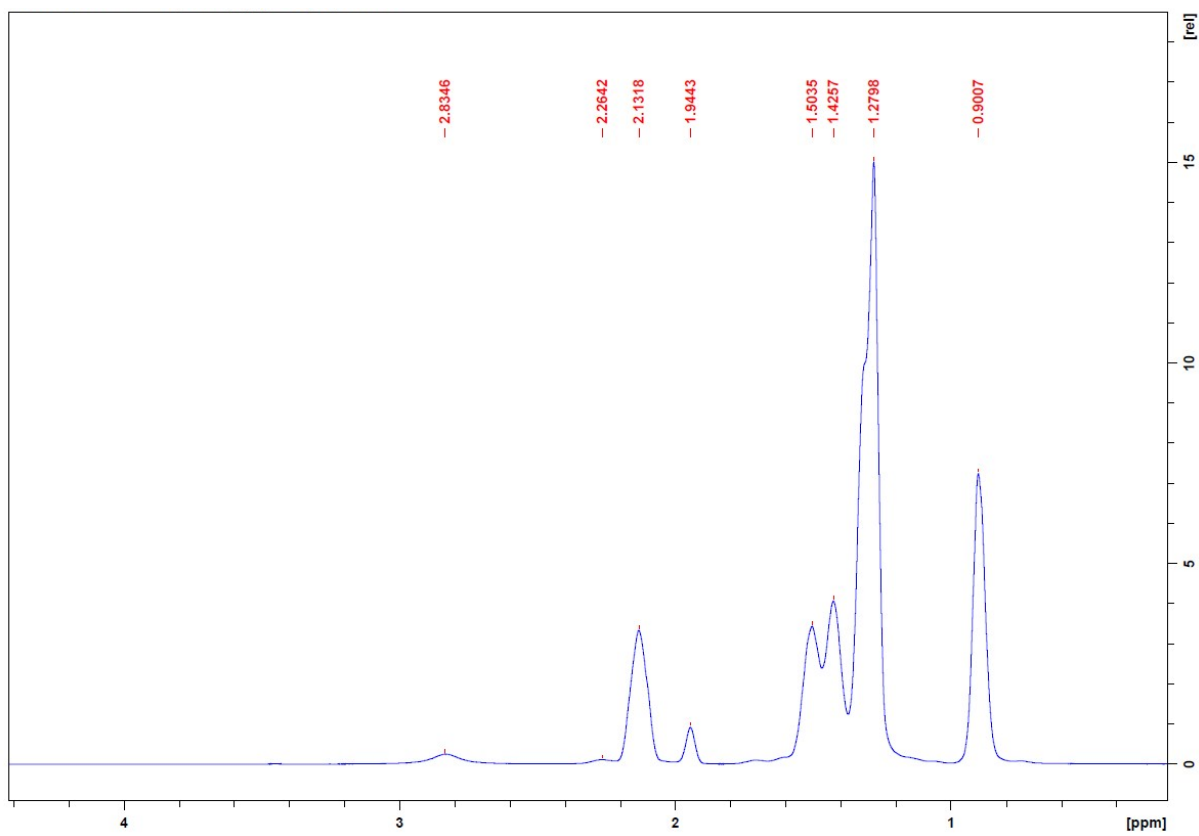
*Supporting information*

**Cobalt(II)/nickel(II) separation from sulfate media by solvent extraction with an undiluted quaternary phosphonium ionic liquid**

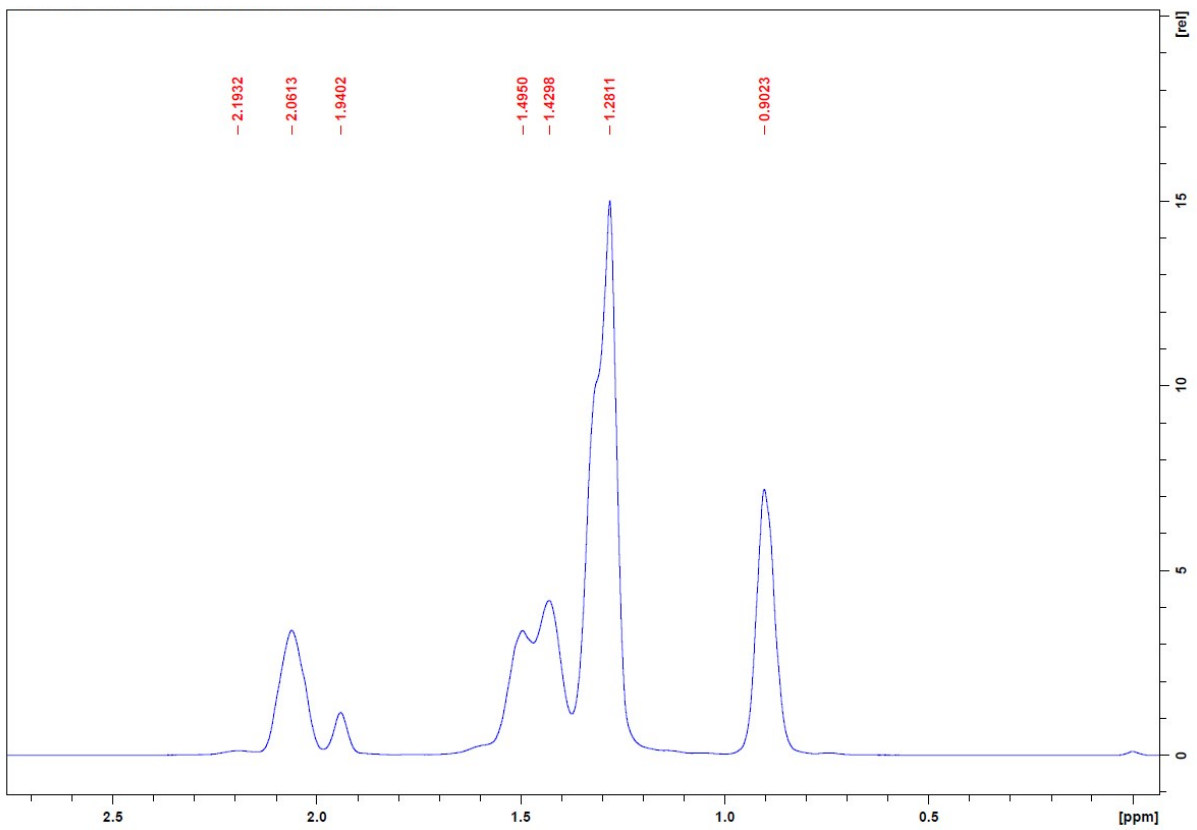
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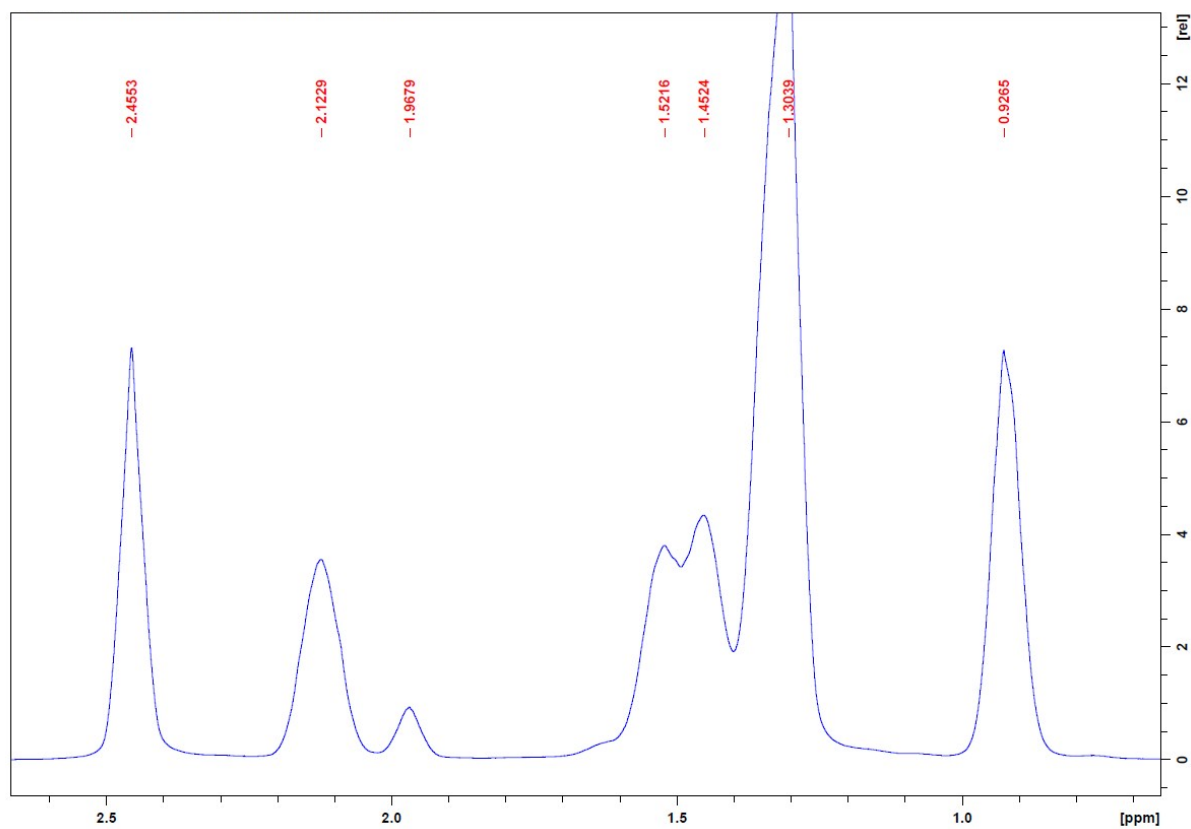
Email: [Koen.Binnemans@kuleuven.be](mailto:Koen.Binnemans@kuleuven.be).



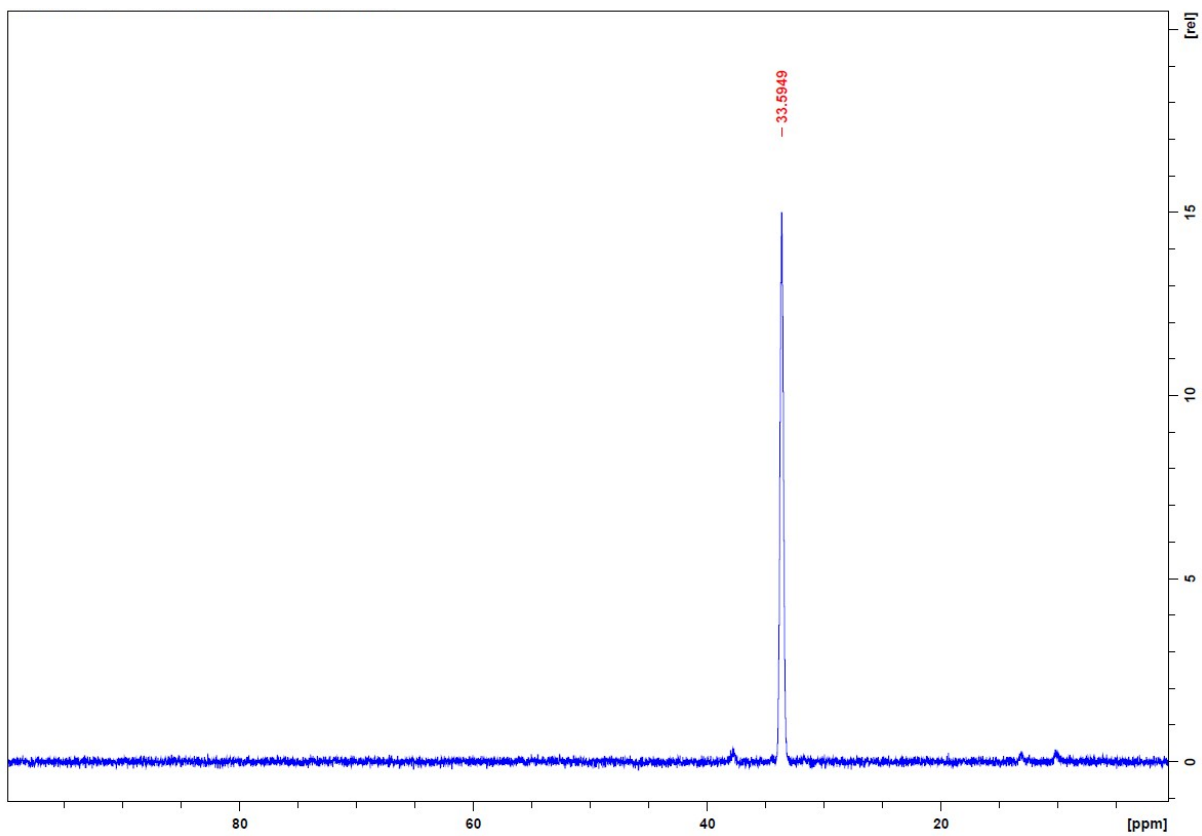
**Figure S1 :**  $^1\text{H}$  NMR spectrum of commercial Cyphos IL 101.



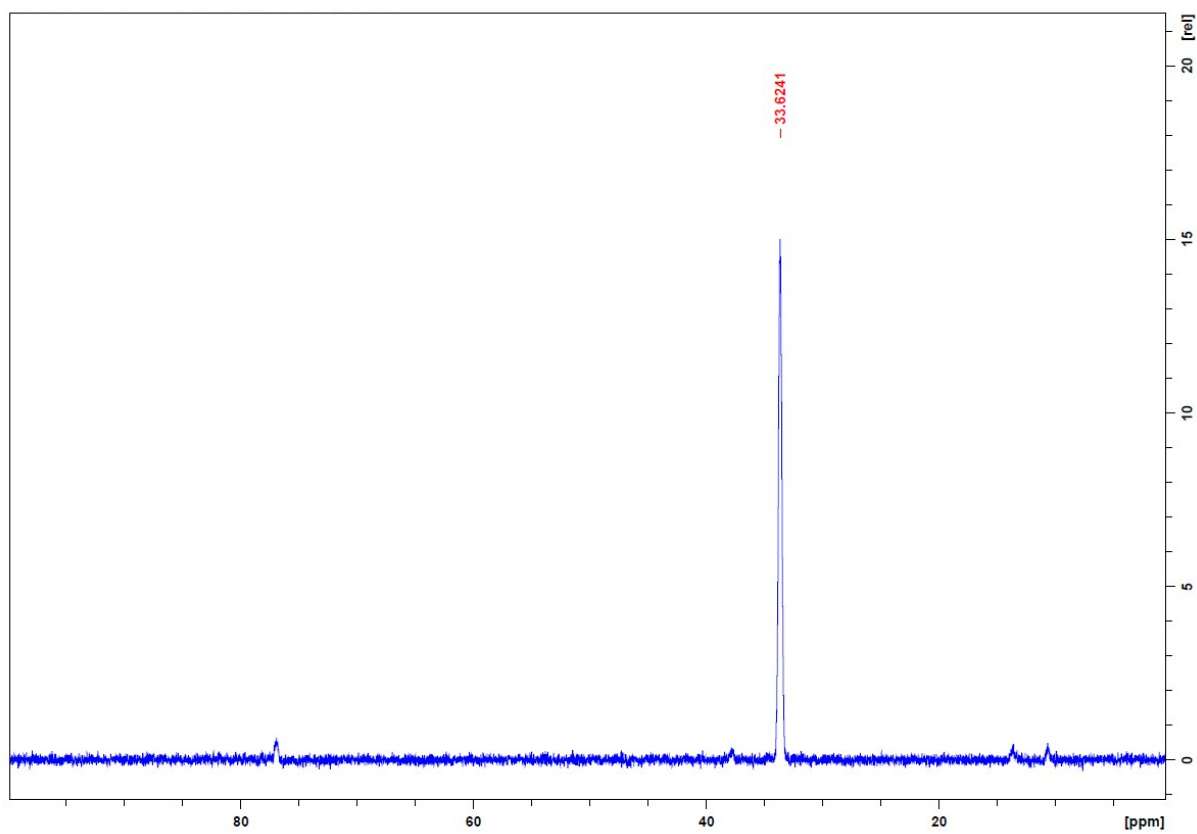
**Figure S2 :** <sup>1</sup>H NMR spectrum of the ionic liquid phase (Cyphos IL 101) after extraction. Initial aqueous phase:  $[\text{Ni}]_{\text{aq,in}} = 0.5 \text{ g}\cdot\text{L}^{-1}$ ,  $[\text{Co}]_{\text{aq,in}} = 0.5 \text{ g}\cdot\text{L}^{-1}$ ,  $[(\text{NH}_4)_2\text{SO}_4]_{\text{aq,in}} = 3 \text{ M}$ ,  $[\text{H}_2\text{SO}_4]_{\text{aq,in}} = 4 \text{ M}$ . A/O = 1:1,  $T_{\text{shaking}} = 25 \text{ }^\circ\text{C}$ .



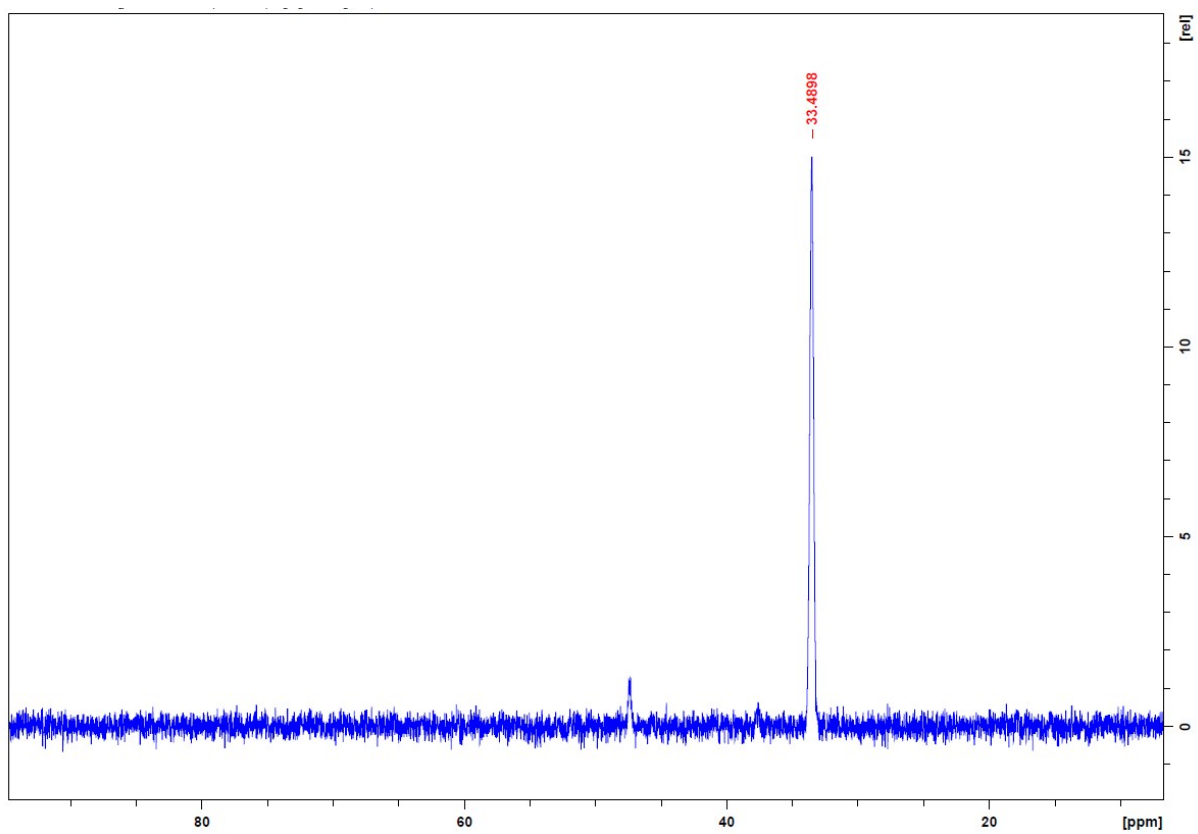
**Figure S3** :  $^1\text{H}$  NMR spectrum of the ionic liquid phase (Cyphos IL 101) after regeneration and neutralisation.



**Figure S4 :**  $^{31}\text{P}$  NMR spectrum of commercial Cyphos IL 101.



**Figure S5 :**  $^{31}\text{P}$  NMR spectrum of the ionic liquid phase (Cyphos IL 101) after extraction. Initial aqueous phase:  $[\text{Ni}]_{\text{aq,in}} = 0.5 \text{ g}\cdot\text{L}^{-1}$ ,  $[\text{Co}]_{\text{aq,in}} = 0.5 \text{ g}\cdot\text{L}^{-1}$ ,  $[(\text{NH}_4)_2\text{SO}_4]_{\text{aq,in}} = 3 \text{ M}$ ,  $[\text{H}_2\text{SO}_4]_{\text{aq,in}} = 4 \text{ M}$ . A/O = 1:1,  $T_{\text{shaking}} = 25 \text{ }^\circ\text{C}$ .



**Figure S6 :**  $^{31}\text{P}$  NMR spectrum of the ionic liquid phase (Cyphos IL 101) after regeneration and neutralisation.