Supporting Materials

Calix[4]arene-Based Amino Extractants Containing *n*-Alkyl Moieties for Separation of Pd(II) and Pt(IV) from Leach Liquors of Automotive Catalysts

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Table S1. The concentrations of metal ions in the leached liquors of automotive catalysts after 25-times dilution.

Metal ions	$[M]_{aq,init}$ (mg/L)
Pd	36.7
Pt	23.3
Rh	13.7
La	32.9
Ce	231.3
Y	1.2
Zr	8.4
Ba	103.5
Al	111.2

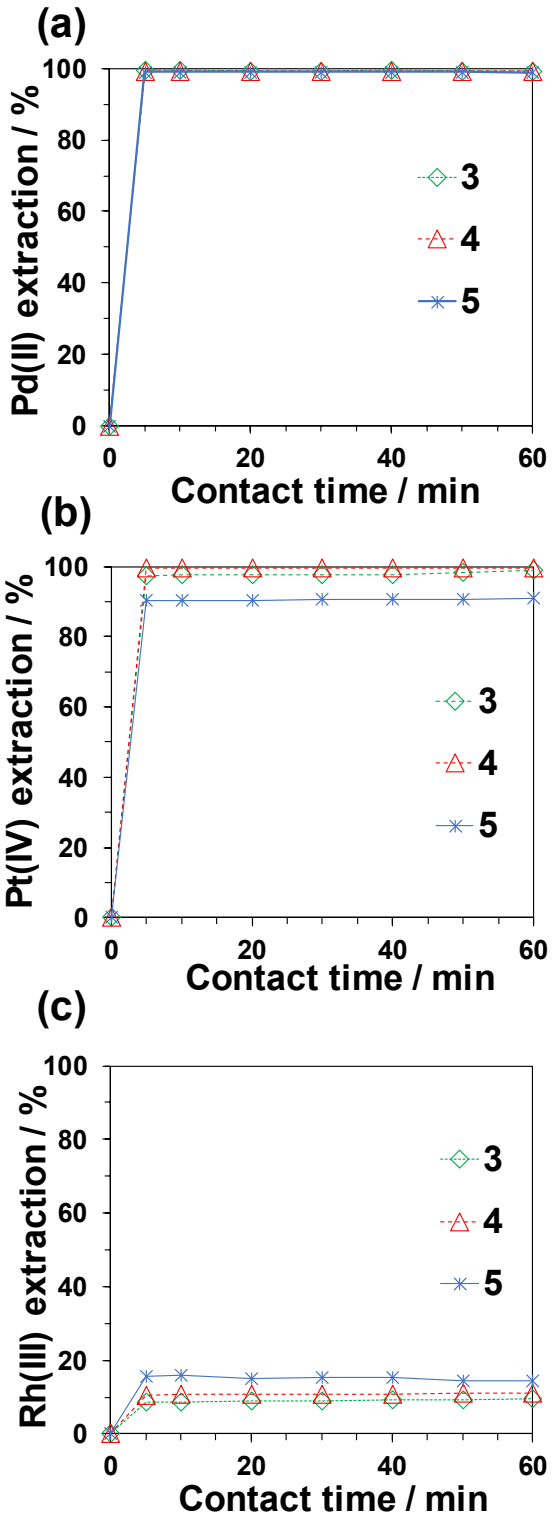

Figure S1 Effects of contact time on the extraction of a) Pd(II), b) Pt(IV), and c) Rh(III) by extractants **3**–**5**. Contact time = 0–60 min; [**3**–**5**] = 1.0 mM; [Pd(II)] = 0.1 mM (10.6 mg/L); [Pt(IV)] = 0.1 mM (19.5 mg/L); [Rh(III)] = 0.1 mM (10.2 mg/L); HCl =0.1 M.

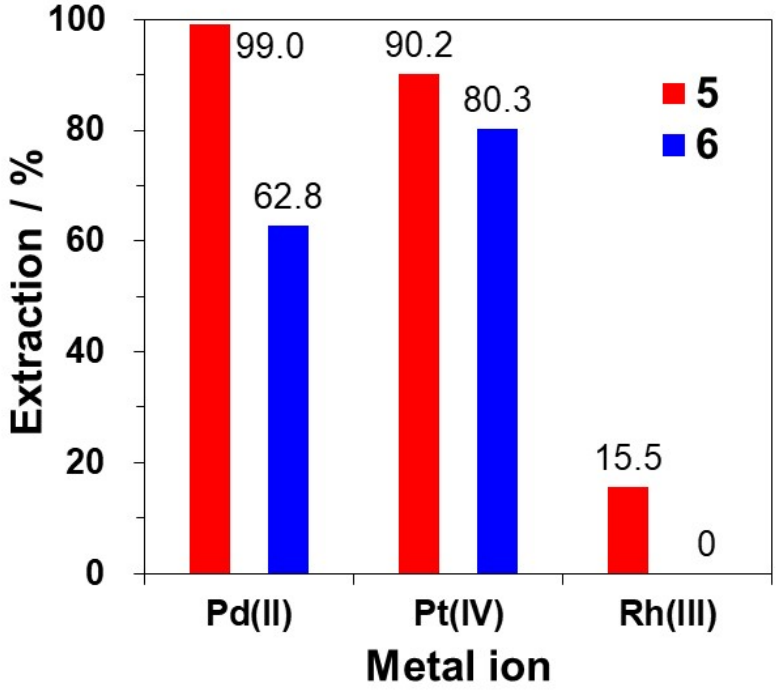

Figure S2 Comparative study of three PGM extractabilities from each single-component PGM solution using macrocyclic **5** and acyclic **6**.

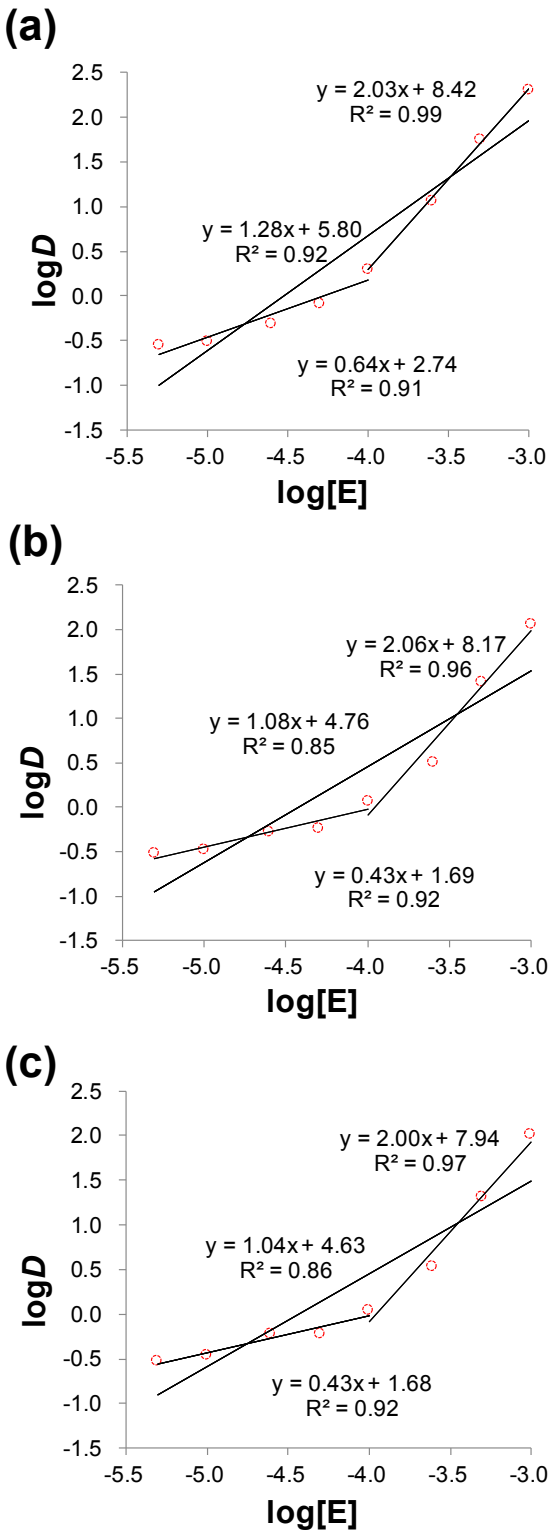

Figure S3 Log–log plot by varying concentration of extractants **3**–**5** on Pd(II) extraction. Conditions: [**3**–**5**] = 0.005–1.0 mM, [HCl] = 0.1 M, [Pd(II)] = 0.1 mM, temperature = 20 ± 1°C, contact time = 60 min.

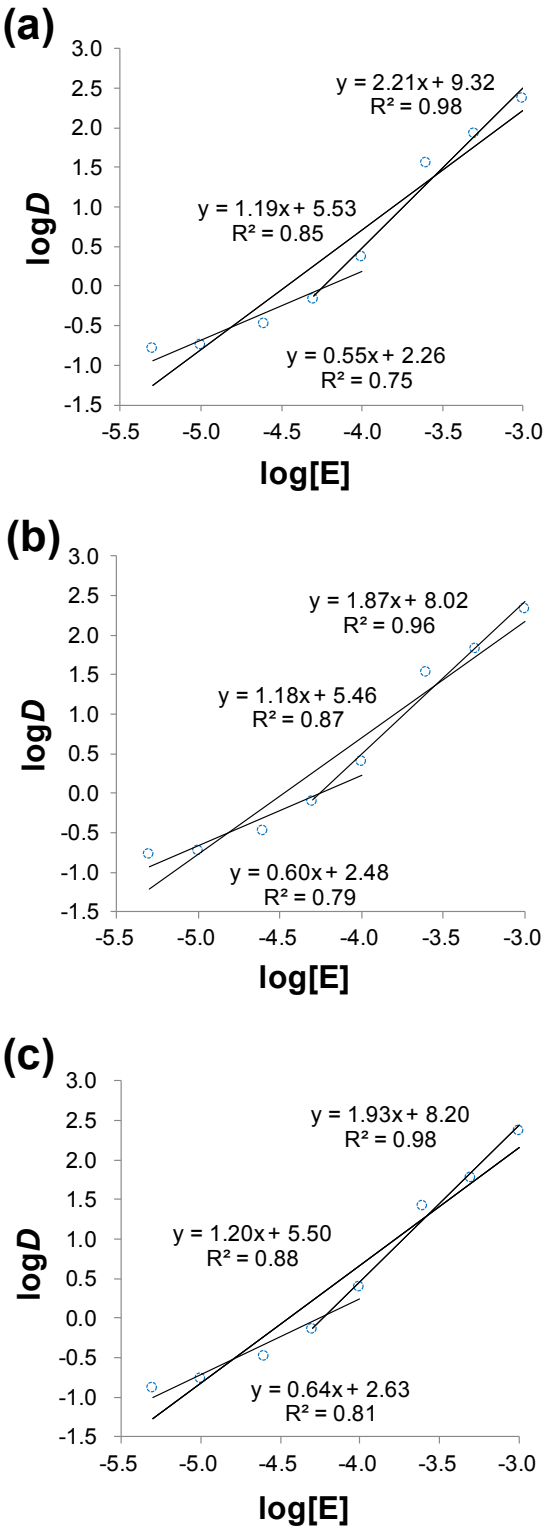

Figure S4 Log–log plot by varying concentration of extractants **3**–**5** on Pt(IV) extraction. Conditions: [**3**–**5**] = 0.005-1.0 mM, [HCl] = 0.1 M, [Pt(IV)] = 0.1 mM, temperature = 20 ± 1 °C, contact time = 60 min.

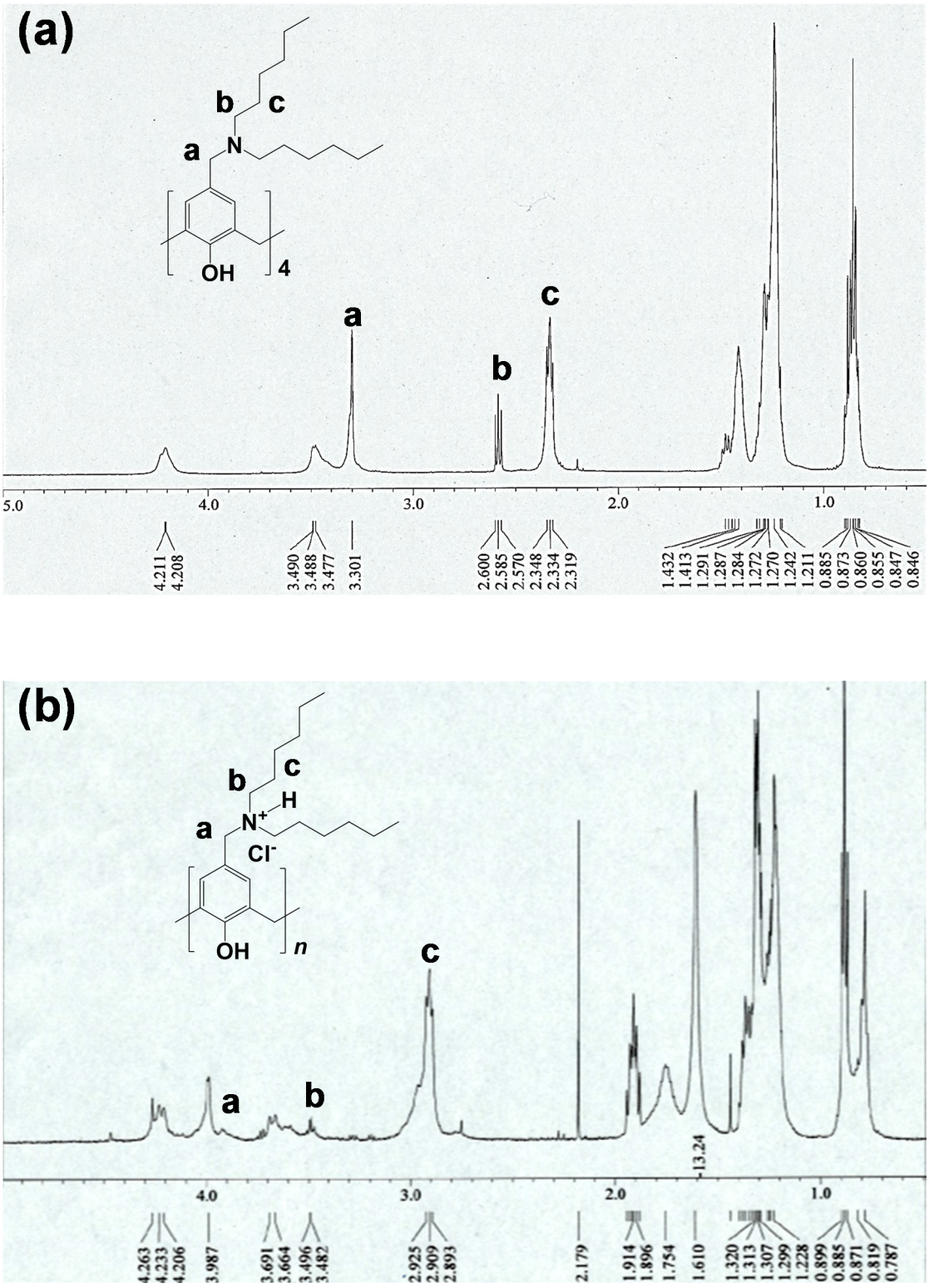

Figure S5 Proton nuclear magnetic resonance (^{1}H NMR) spectra of (a) native extractant **3** and (b) 0.1 M HCl-treated **3**.

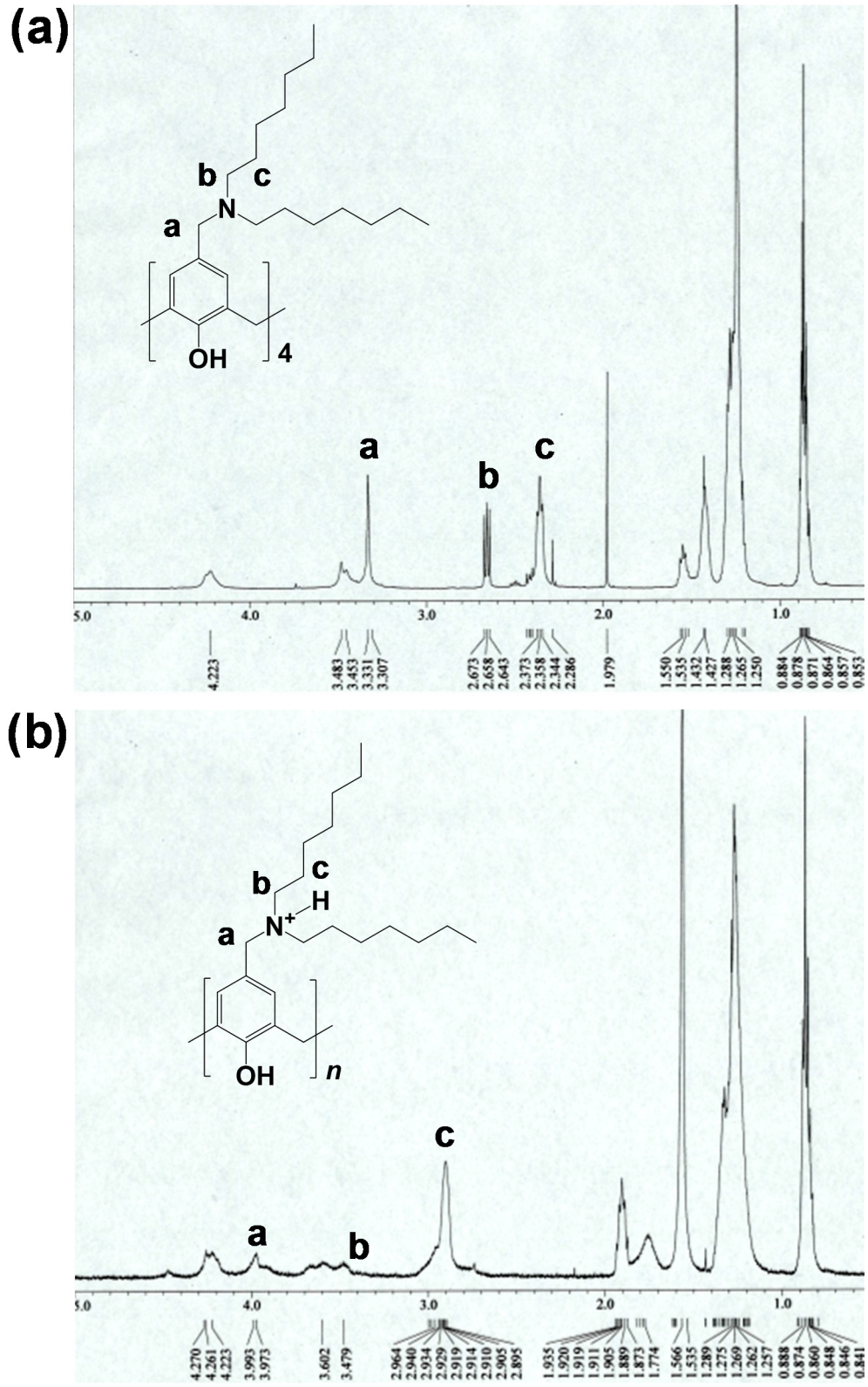

Figure S6 ^{1}H NMR spectra of (a) native extractant **4** and (b) 0.1 M HCl-treated **4**.

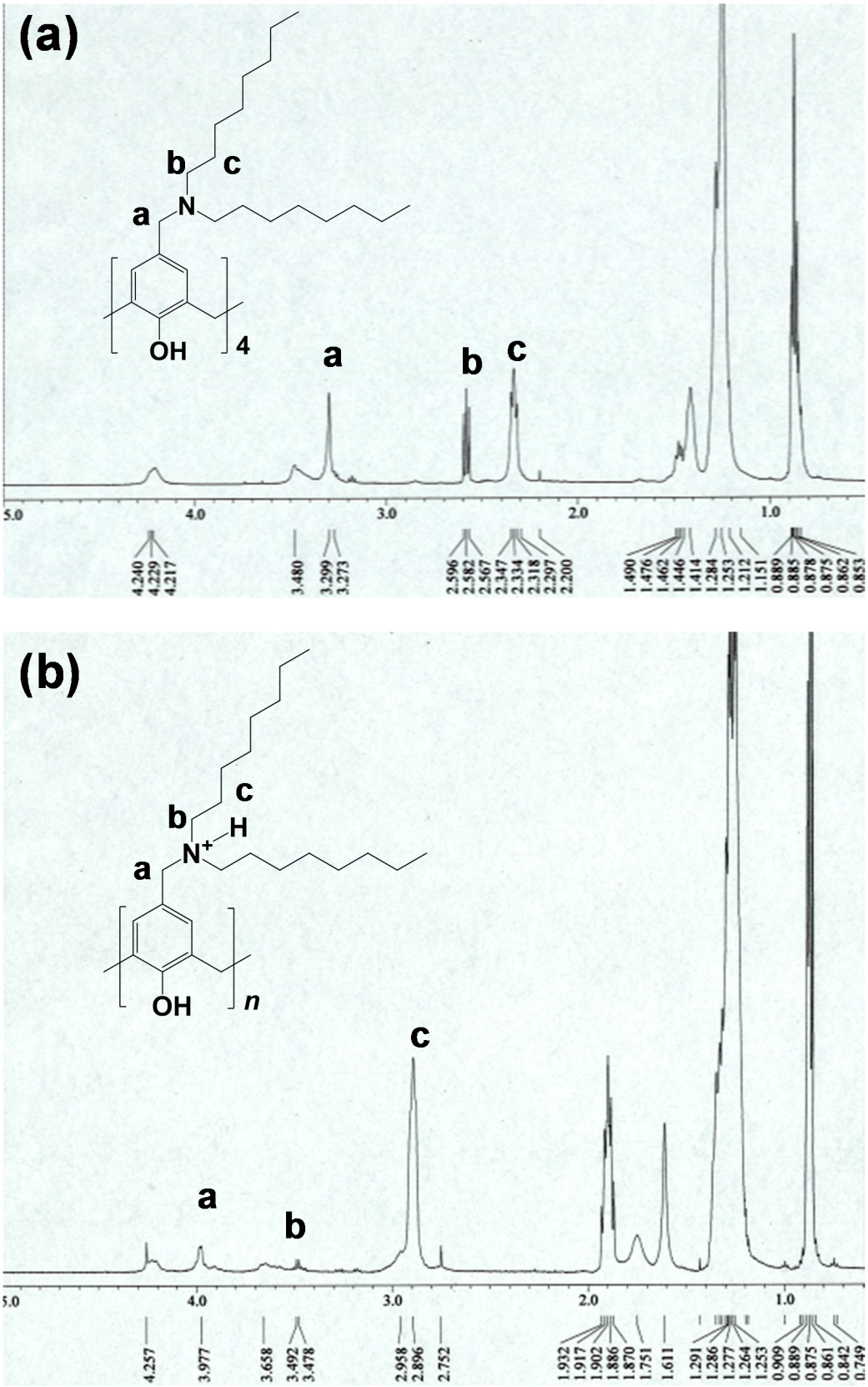

Figure S7 ^{1}H NMR spectra of (a) native extractant **5** and (b) 0.1 M HCl-treated **5**.

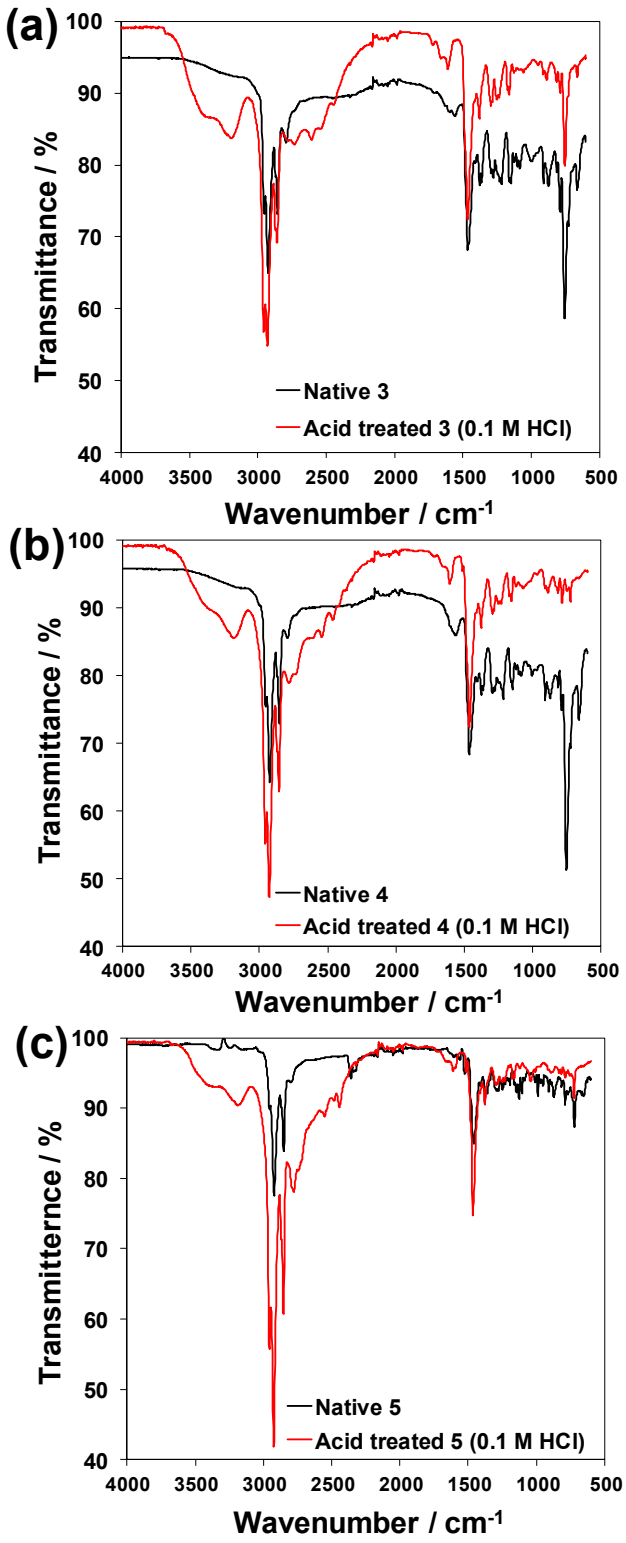

Figure S8 Comparison of attenuated total refection Fourier transform infrared (ATR-FTIR) spectra of 0.1 M HCl-treated (a) **3**, (b) **4**, and (c) **5** with those of native extractants (a) **3**, (b) **4**, and (c) **5**.