

Supplementary material for

One-pot synthesis of lignin-stabilised platinum and palladium nanoparticles and their catalytic behaviour in oxidation and reduction reactions

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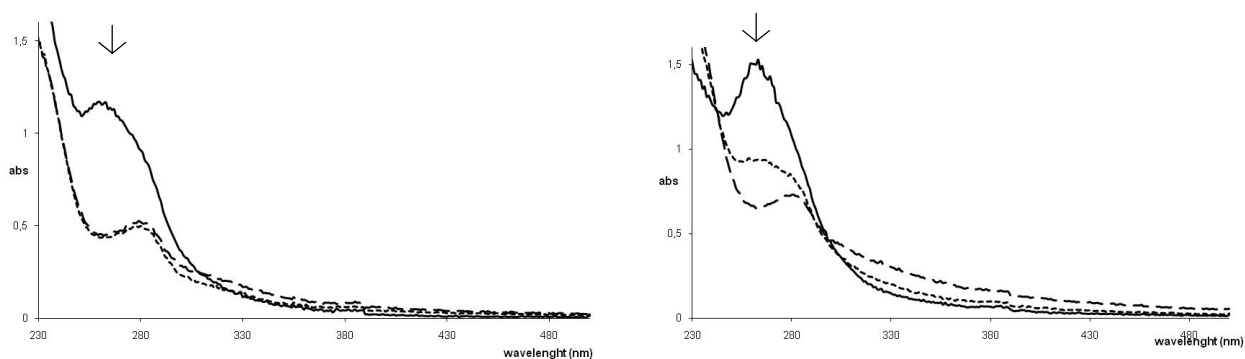


Figure S1. UV- vis spectra acquired (0 h, solid lines; 0.5 h, short-dashed lines; 4 h, long-dashed lines) during the formation of Pt NPs in the presence of CaLig (left) and AmLig (right). The absorption of Pt^{IV} at 258 nm disappears when the NPs were formed. Note the absorption at 280 nm attributable to the aromatic moieties of lignins.

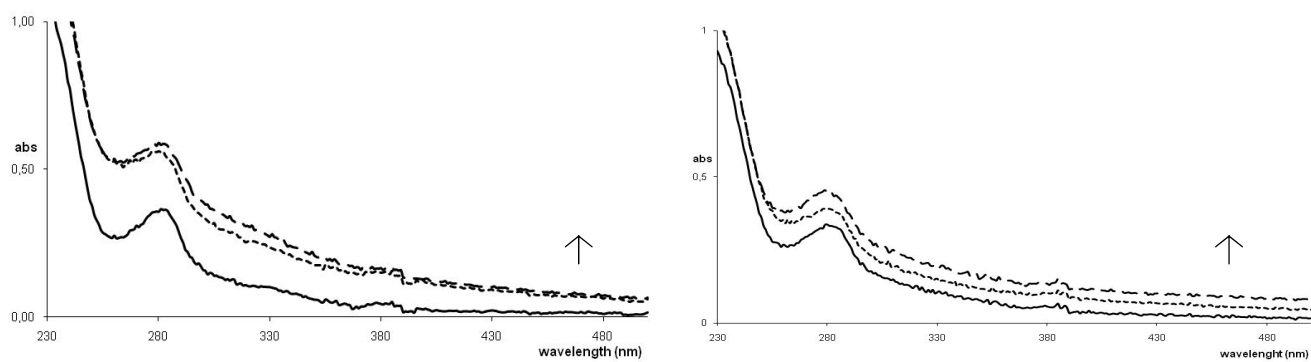


Figure S2. UV-vis spectra acquired (0, solid lines; 0.5 h, short-dashed lines; 4 h, long-dashed lines) during the formation of Pd NPs in the presence of CaLig (left) and AmLig (right).

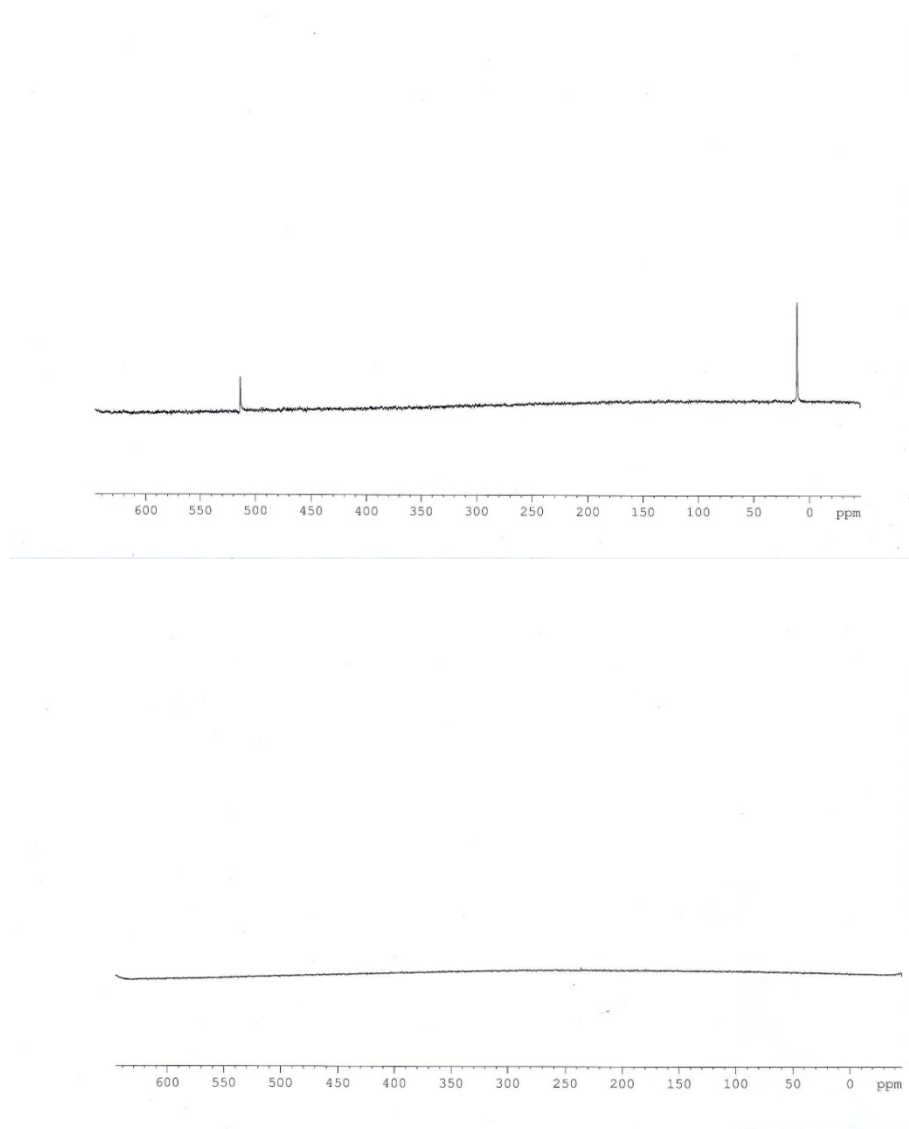


Figure S3. ^{195}Pt NMR spectra of a saturated water solution of PtCl_6^{2-} (top) and a six-fold concentrated solution of Pt NP solutions (bottom).

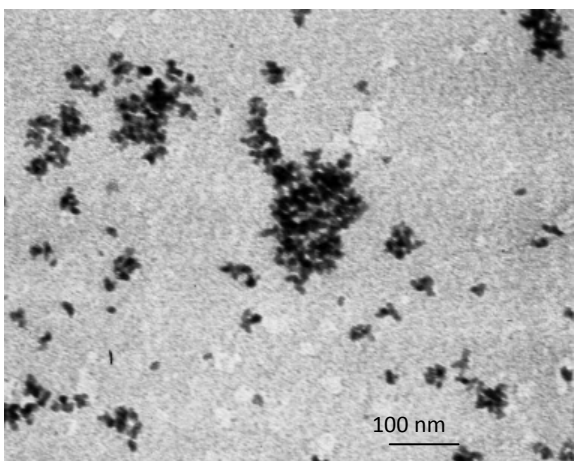
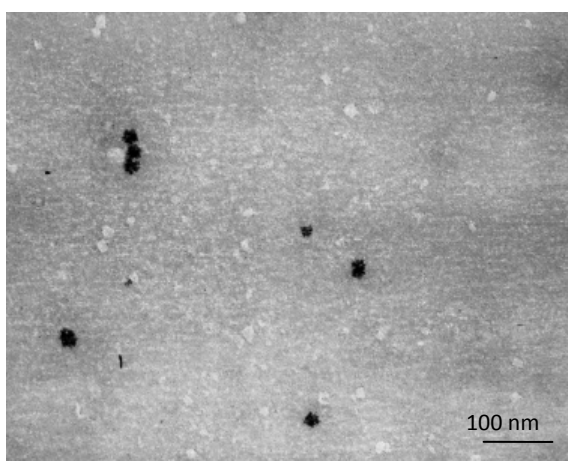
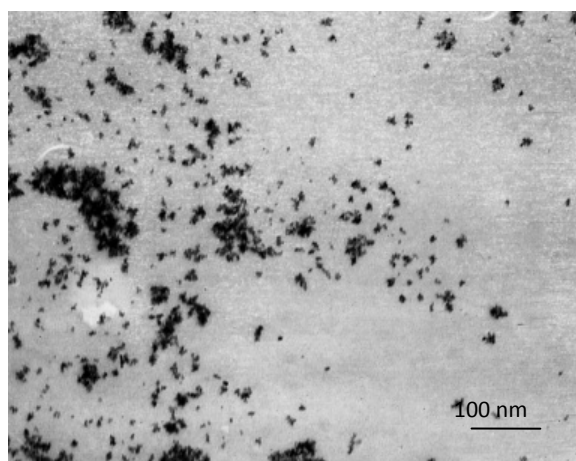


Figure S4. TEM images of AmLig Pt NPs (top, left), CaLig Pt NPs (top, right) and fulvic acid Pt NPs (bottom).

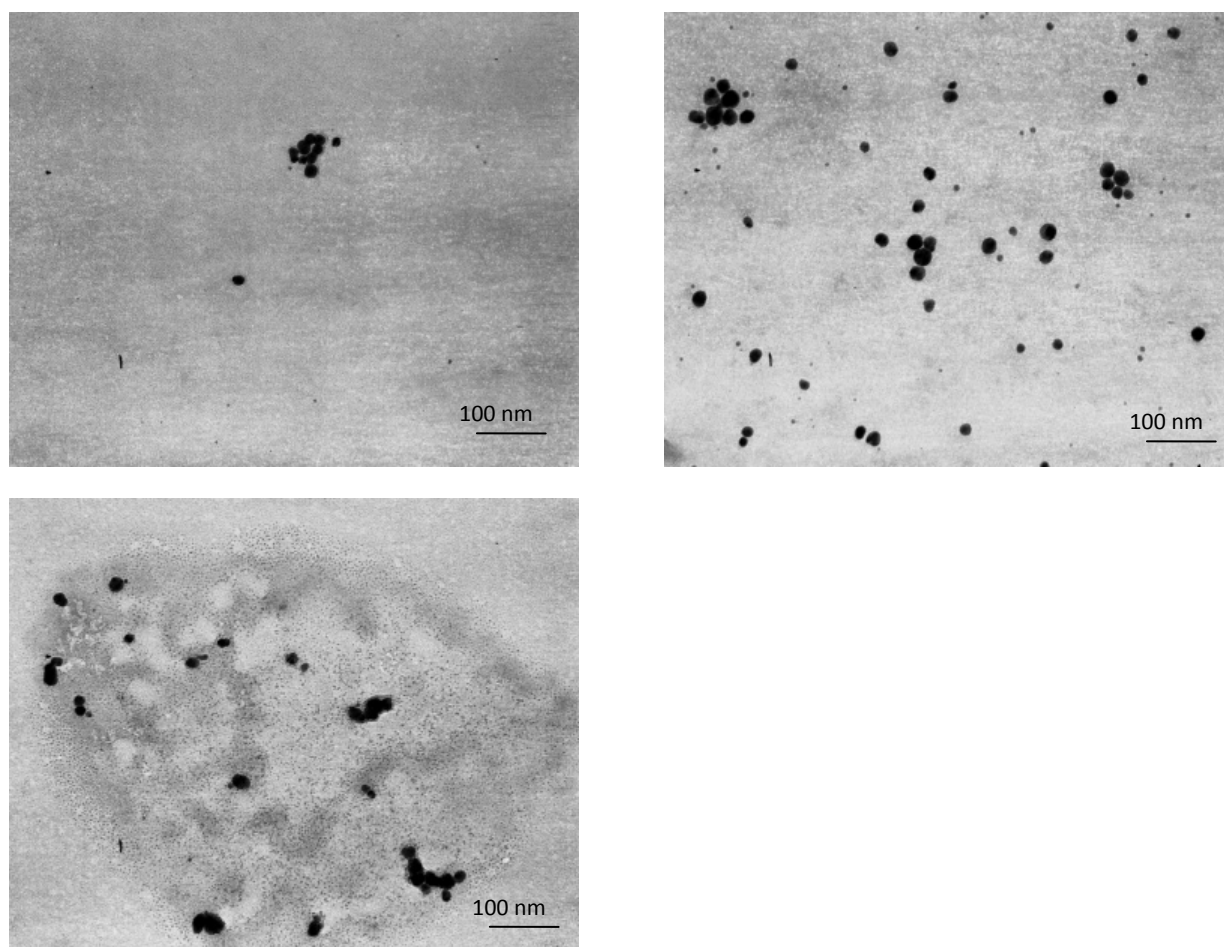


Figure S5. TEM images of AmLig Pd NPs (top, left), CaLig Pd NPs (top, right) and fulvic acid Pd NPs (bottom).

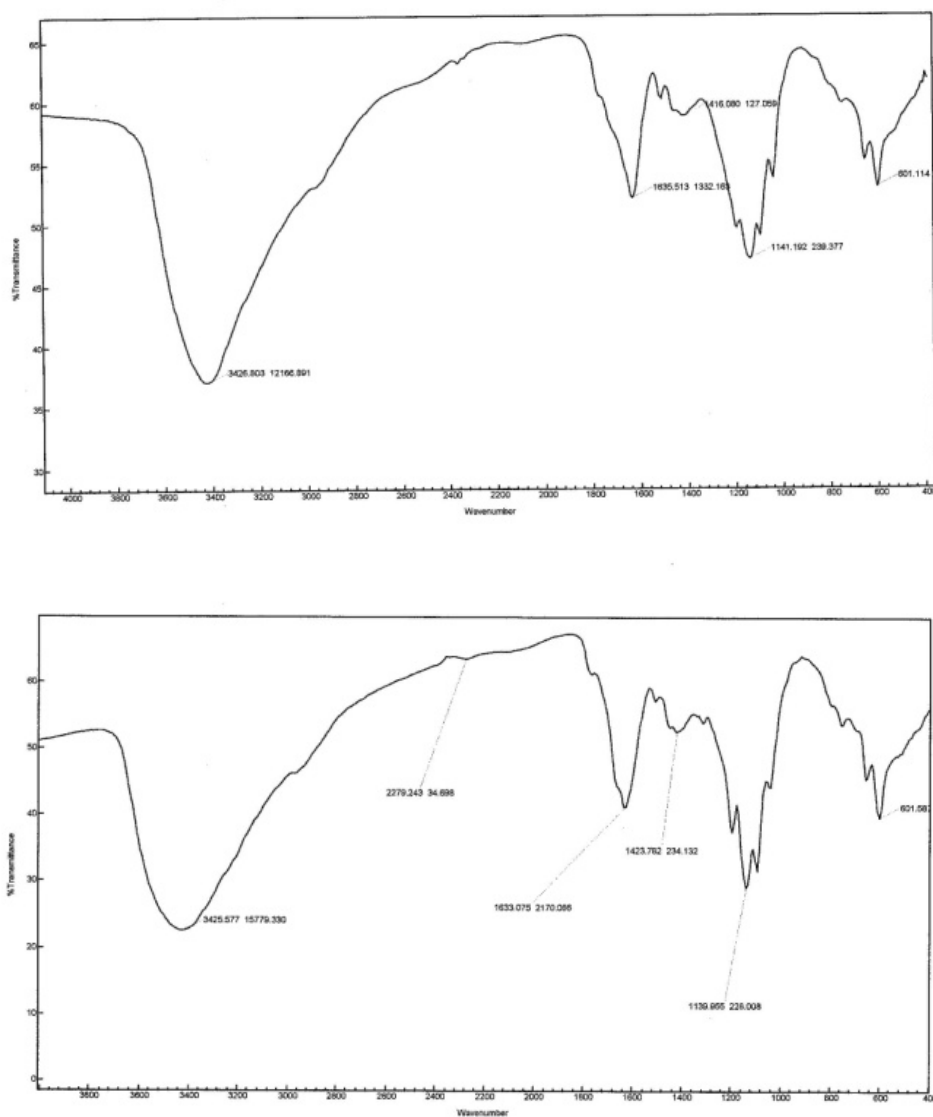


Figure S6. FT-IR spectrum of fulvic acid (top) and fulvic acid Pt NPs (bottom).

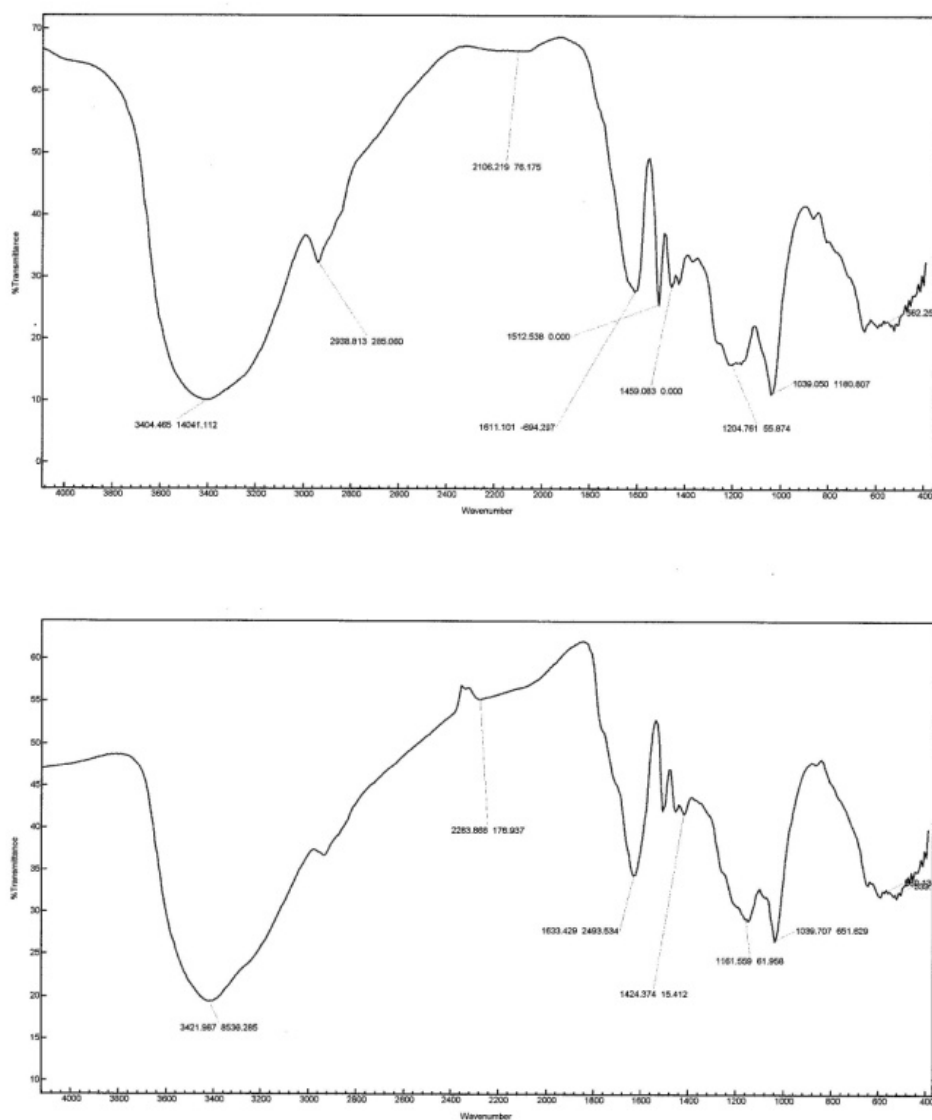


Figure S7. FT-IR spectra of CaLig (top) and CaLig Pt NPs (bottom).

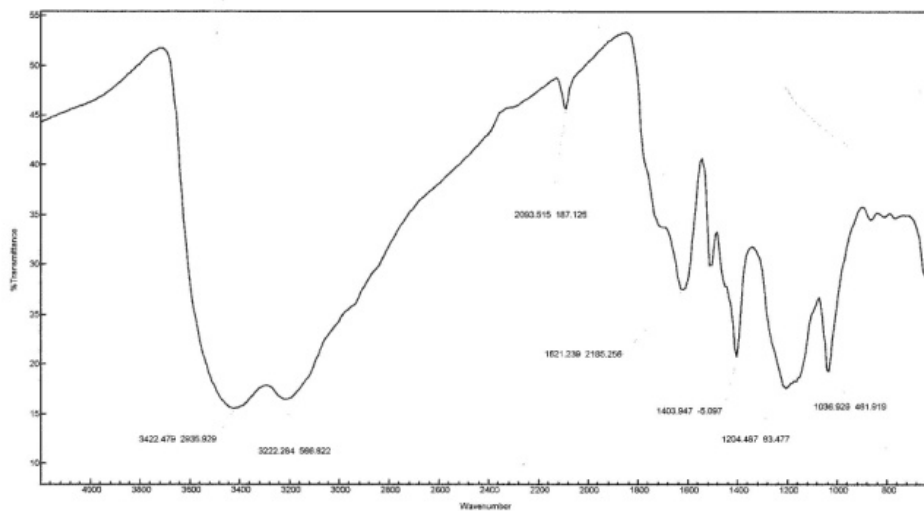
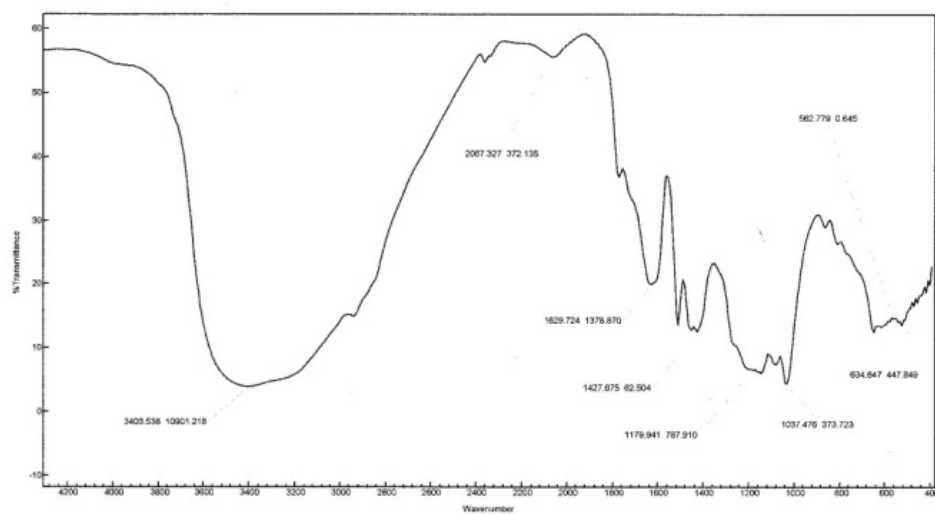


Figure S8. FT-IR spectra of AmLig (top) and AmLig Pt NPs (bottom).

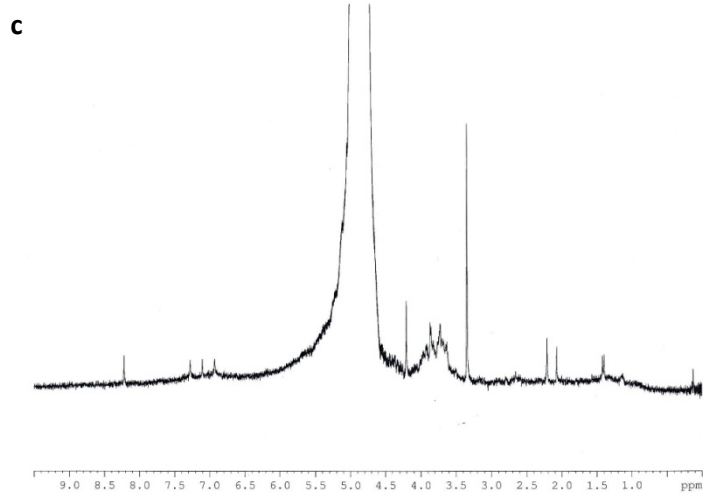
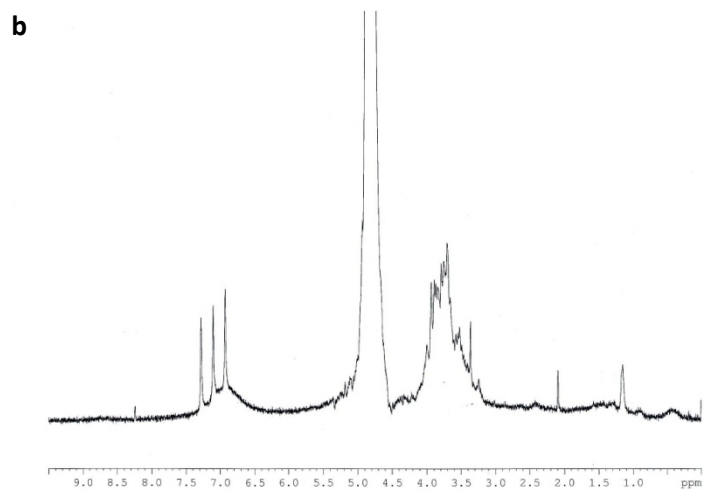
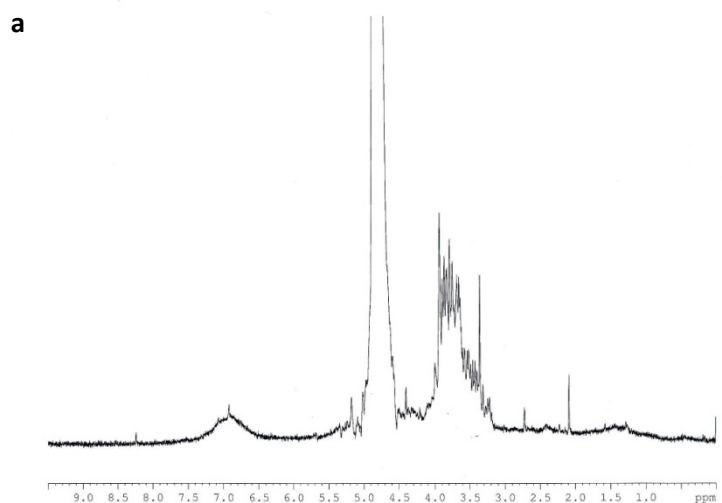


Figure S9. ^1H NMR of solutions of CaLig Pt NPs (a), AmLig Pt NPs (b), and fulvic acid Pt NPs (c)

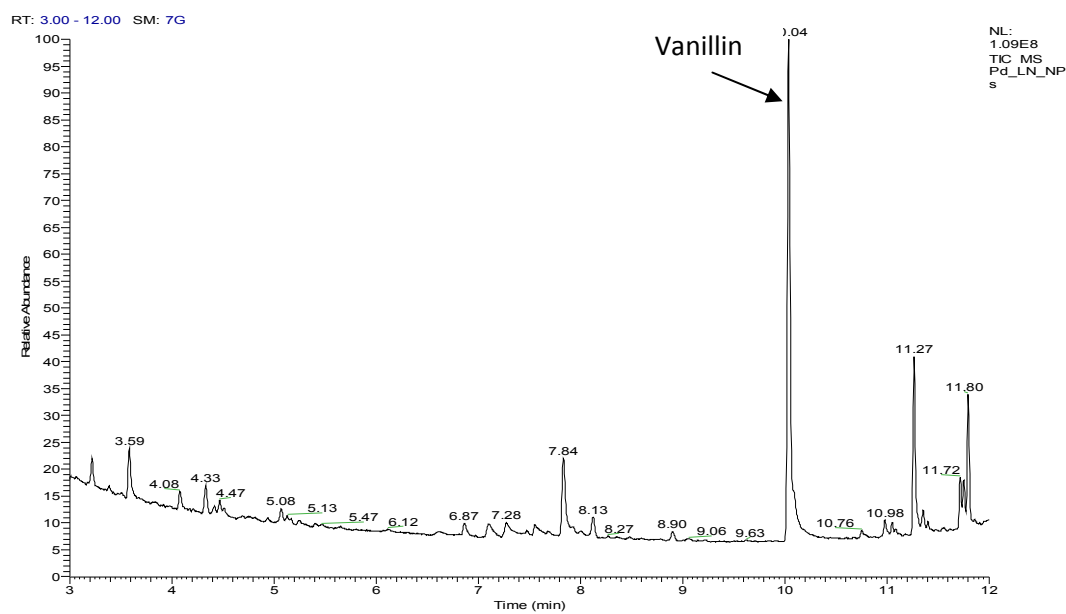
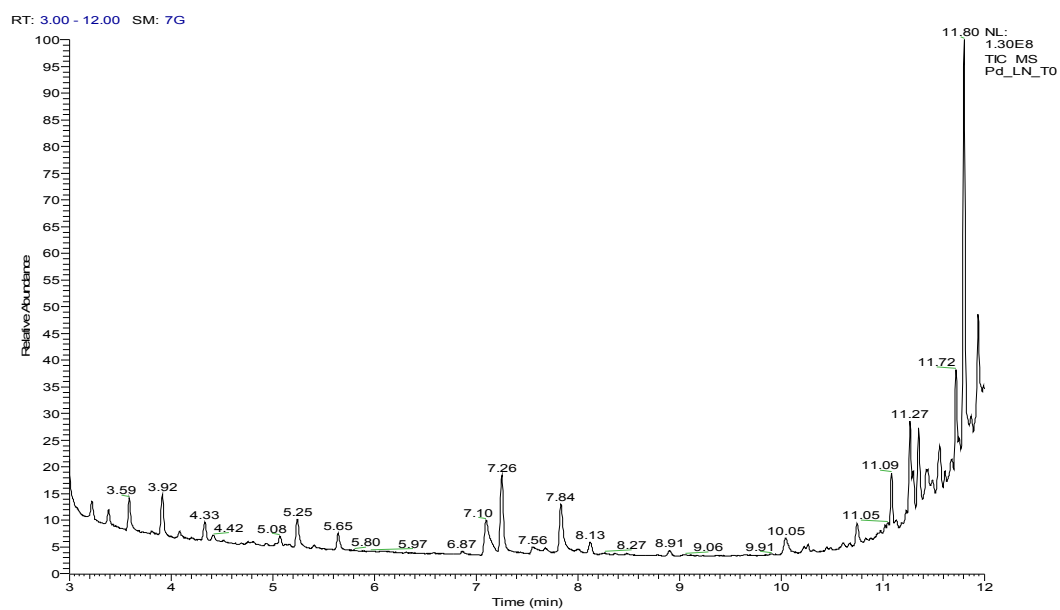


Figure S10. GC-MS chromatograms of chloroform extracts of AmLig solution (top) and AmLig Pd NP solution (bottom)

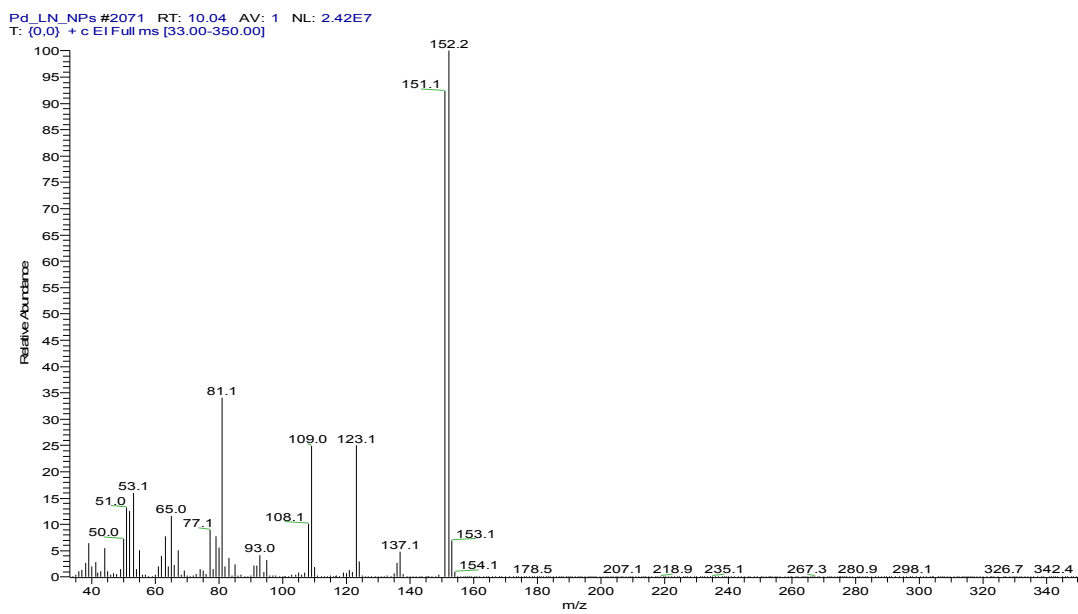


Figure S11. Electronic impact (70 eV) mass spectrum of vanillin.