Electronic Supplementary Material (ESI) for Dalton Transactions

Oxidation mechanism of tetrachloroplatinate(II) by hydrogen peroxide in hydrochloric acid solution

Pieter Murray,[a,b] Klaus R. Koch[a]* and Rudi van Eldik[b]*

[a] Department of Chemistry and Polymer Science, University of Stellenbosch, Private Bag X1, 7602 Matieland, South Africa *krk@sun.ac.za

[b] Department of Chemistry and Pharmacy, University of Erlangen-Nürnberg, Egerlandstr. 1, 91058 Erlangen, Germany. *rudi.vaneldik@chemie.uni-erlangen.de

Electronic Supplementary Information (ESI)

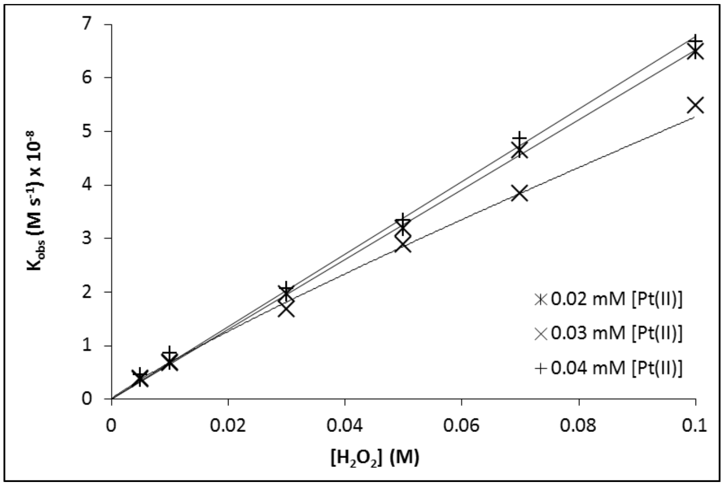

Figure S1A. Dependence of $k_{obs}{}^{0}$ on the concentration of H_2O_2 for the oxidation of 0.02, 0.03 and 0.04 mM $[PtCl_4]^{2-}$.

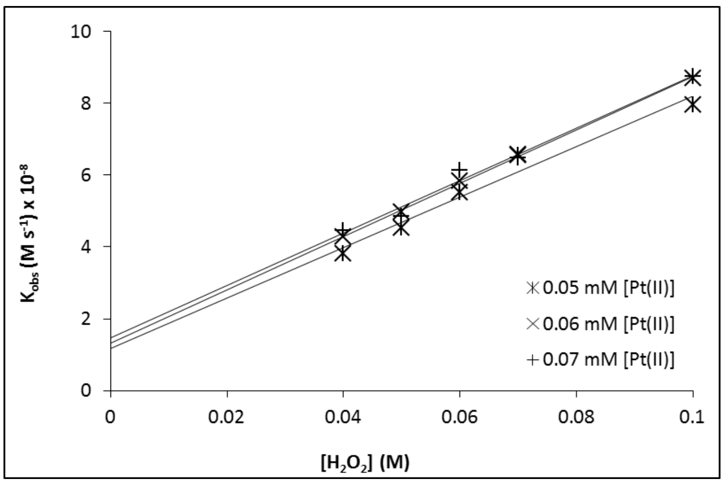

Figure S1B. Dependence of $k_{obs}{}^{0}$ on the concentration of H_2O_2 for theoxidation of 0.05, 0.06 and 0.07 mM $[PtCl_4]^{2-}$.

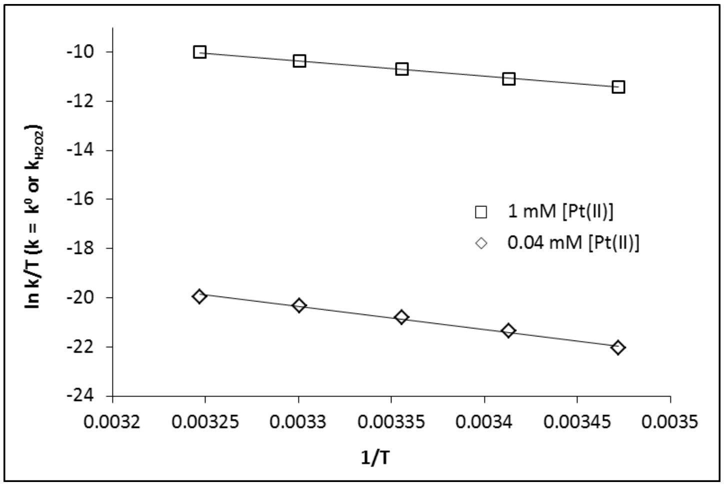

Figure S2. Eyring plots for the oxidation of 0.04 mM $[PtCl_4]^{2-}$ by 100 mM H_2O_2, and of 1 mM $[PtCl_4]^{2-}$ by 300 mM H_2O_2.

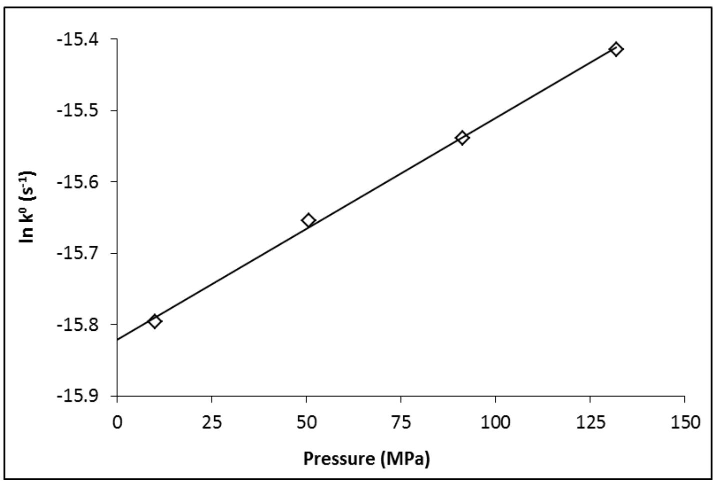

Figure S3. Plot of ln k^0 (s^{-1}) as a function of pressure to calculate the activation volume for the zero-order mechanism.

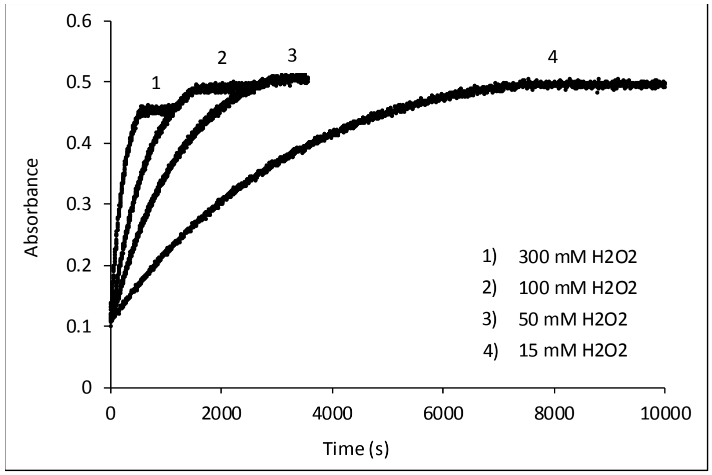

Figure S4. Absorbance *vs*. time plots at 353 nm and 35 °C for the oxidation of 1 mM $[PtCl_4]^{2-}$ by various concentrations of H_2O_2, $[H^+]$, $[Cl^-]$ = 1 M.

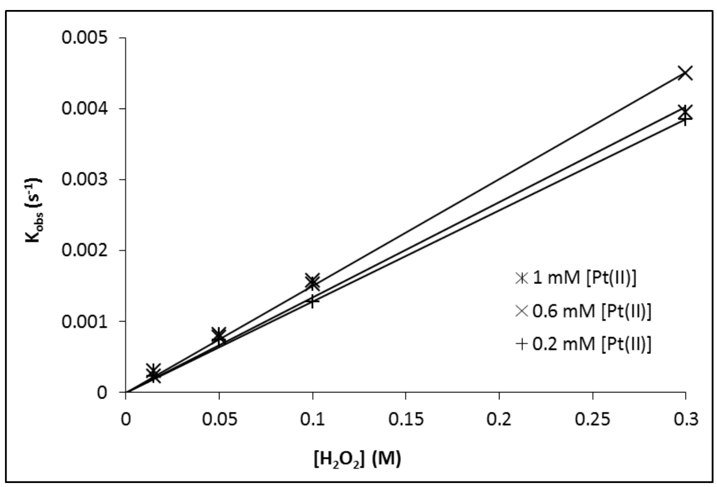

Figure S5. The dependence of k_{obs} on the H_2O_2 concentration for oxidation of 1, 0.6, and 0.2 mM $[PtCl_4]^{2-}$.

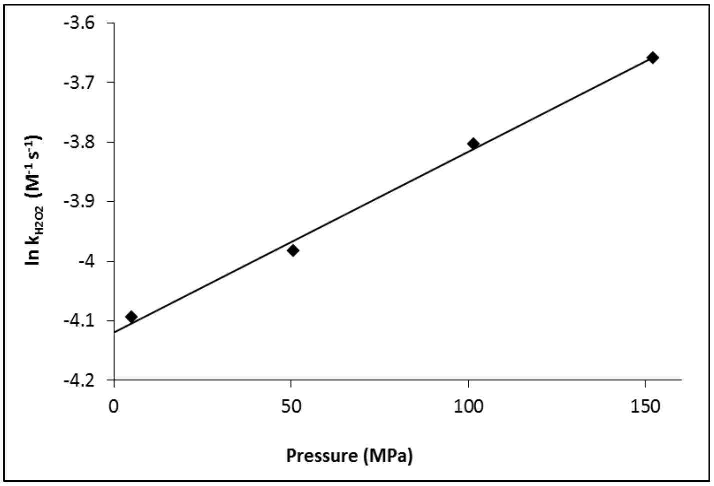

Figure S6. Plot of lnk_{H2O2} as a function of pressure (MPa) to calculate the activation volume for the pseudo-first order mechanism.

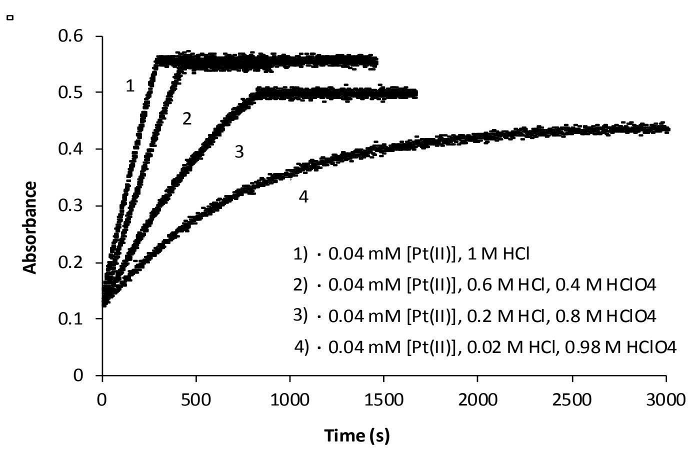

Figure S7. Absorbance *vs*. time plots at 353 nm and 35 °C for the oxidation of 0.04 mM $[PtCl_4]^{2-}$ as a function of chloride concentration. Concentrations of $[PtCl_4]^{2-}$ was kept constant at 0.04 mM, $[H_2O_2]$ at 80 mM and ionic strength 1 M.

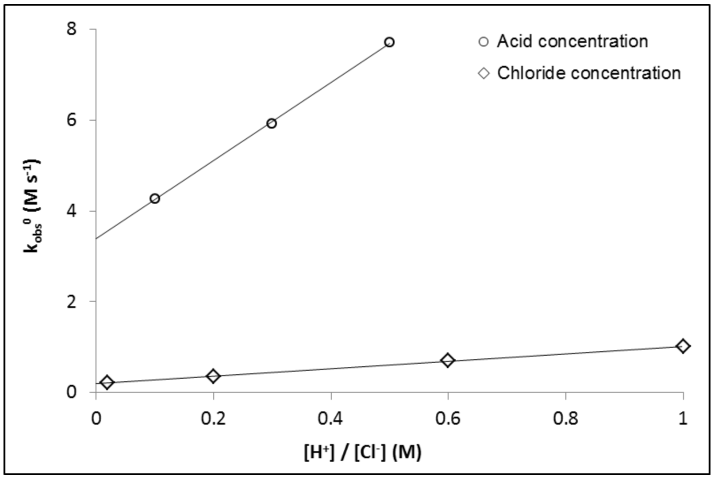

Figure S8. Plots of k_{obs}^{0} (M s^{-1}) as a function of acid and chloride concentration. $[PtCl_4]^{2-}$ = 0.04 mM; $[H_2O_2]$ = 80 mM and ionic strength = 1 M.