Electronic Supplementary Information for

Electrochemical Studies of Hydrogen Chloride Gas in Several Room Temperature Ionic Liquids: Mechanism and Sensing

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Figure legends

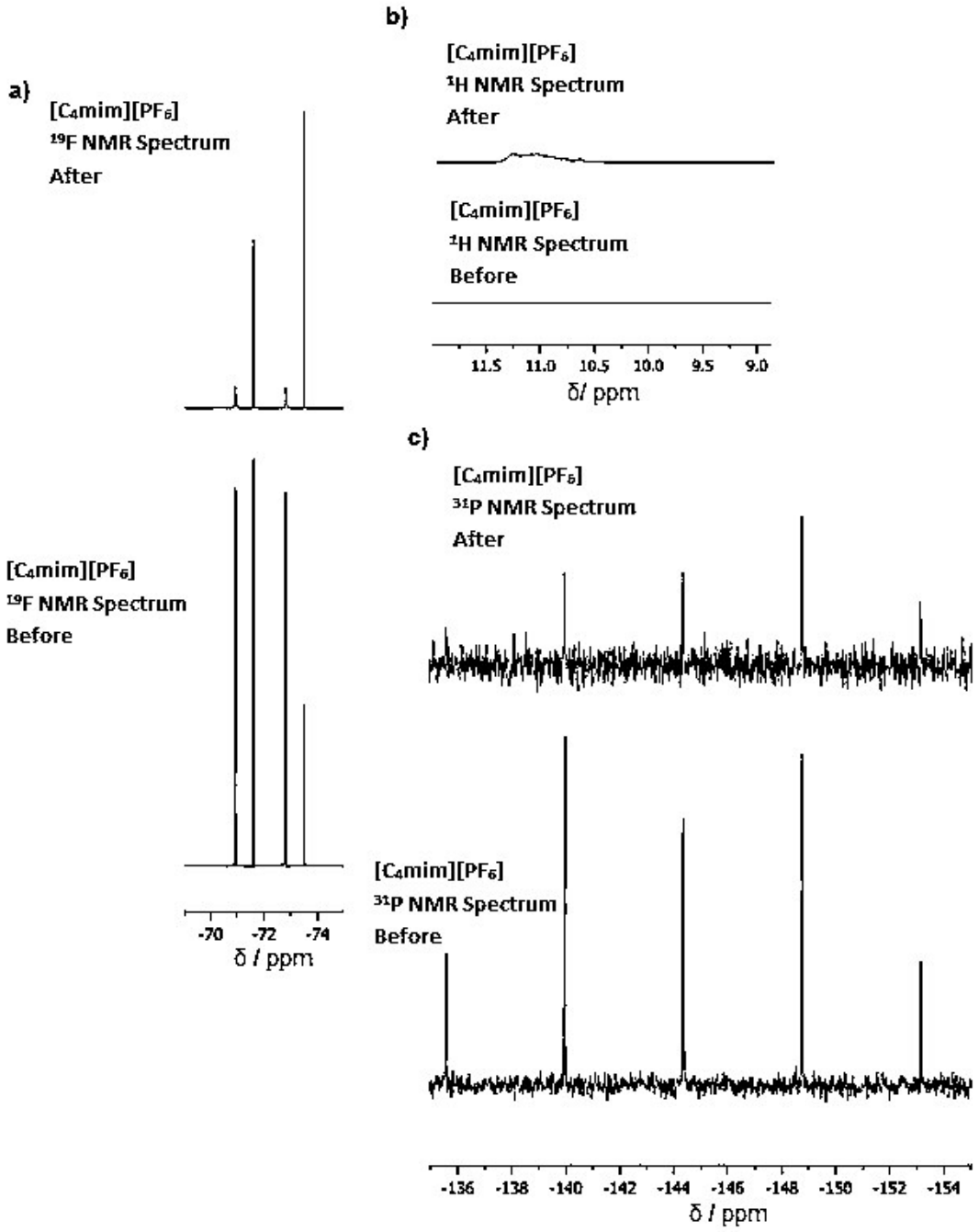
Figure S1: NMR spectra for a) ^{19}F, b) ^{1}H and c) ^{31}P in $[C_4mim][PF_6]$ before and after experiments with HCl. ^{1}H Spectra shows the formation of hydrogen bonds after experiments due to features at 11 ppm. ^{19}F and ^{31}P spectra shows that the ratio of P and F before and after experiments have changed, possibility due to the formation of HF and PF_{6-n} where n is less than 6.

Figure S2: CVs for the oxidation (first scan) of 2.56 % hydrogen chloride gas on a 8.3 μm radius Pt electrode in a) $[C_2mim][NTf_2]$, b) $[C_4mim][NTf_2]$, c) $[C_6mim][FAP]$, d) $[C_4mpyrr][NTf_2]$, e) $[C_4mim][BF_4]$, f) $[C_4mim][PF_6]$ at various scan rates between 0.05-2 V/s. The labels for peaks (I) to (V) are not included for $[C_4mim][PF_6]$ (f) due to different reactions occurring in this RTIL.

Figure S3: Plots of currents vs square root of scan rate in $[C_2mim][NTf_2]$ on a Pt microelectrode (diameter 8.3 μm) for a) $[HCl_2]^-$ oxidation during first scan, b) $[HCl_2]^-$ oxidation during second scan, c) H^+ reduction and d) Cl^- oxidation.

Figure S4: Plots of current vs square root of scan rate in $[C_4mim][NTf_2]$ on a Pt microelectrode (diameter 8.3 μm) for a) $[HCl_2]^-$ oxidation during first scan, b) $[HCl_2]^-$ oxidation during second scan, c) H^+ reduction and d) Cl^- oxidation.

Figure S5: Plots of current vs square root of scan rate in $[C_4mpyrr][NTf_2]$ on a Pt microelectrode (diameter 8.3 μm) for a) $[HCl_2]^-$ oxidation during first scan, b) $[HCl_2]^-$ oxidation during second scan, c) H^+ reduction and d) Cl^- oxidation.



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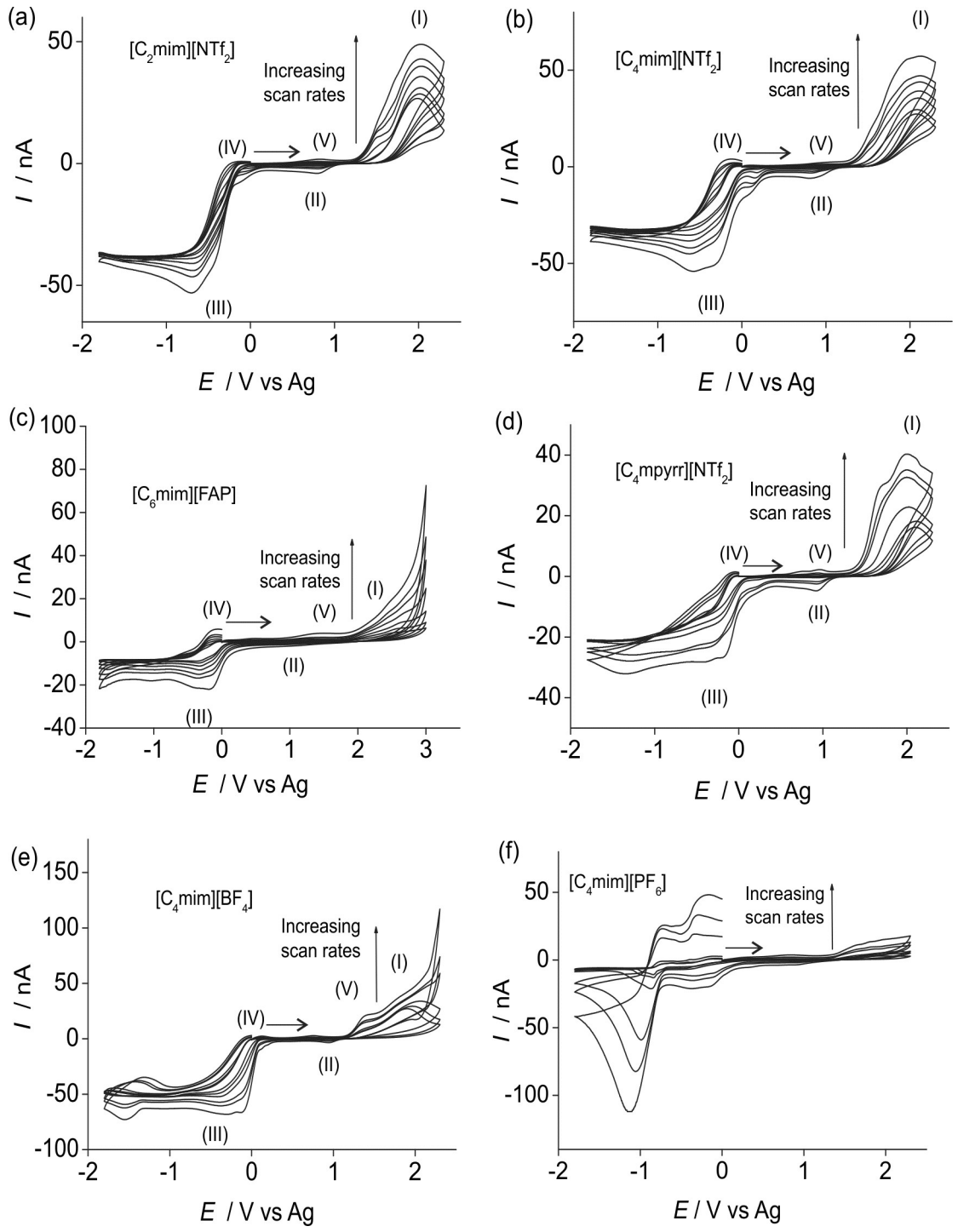

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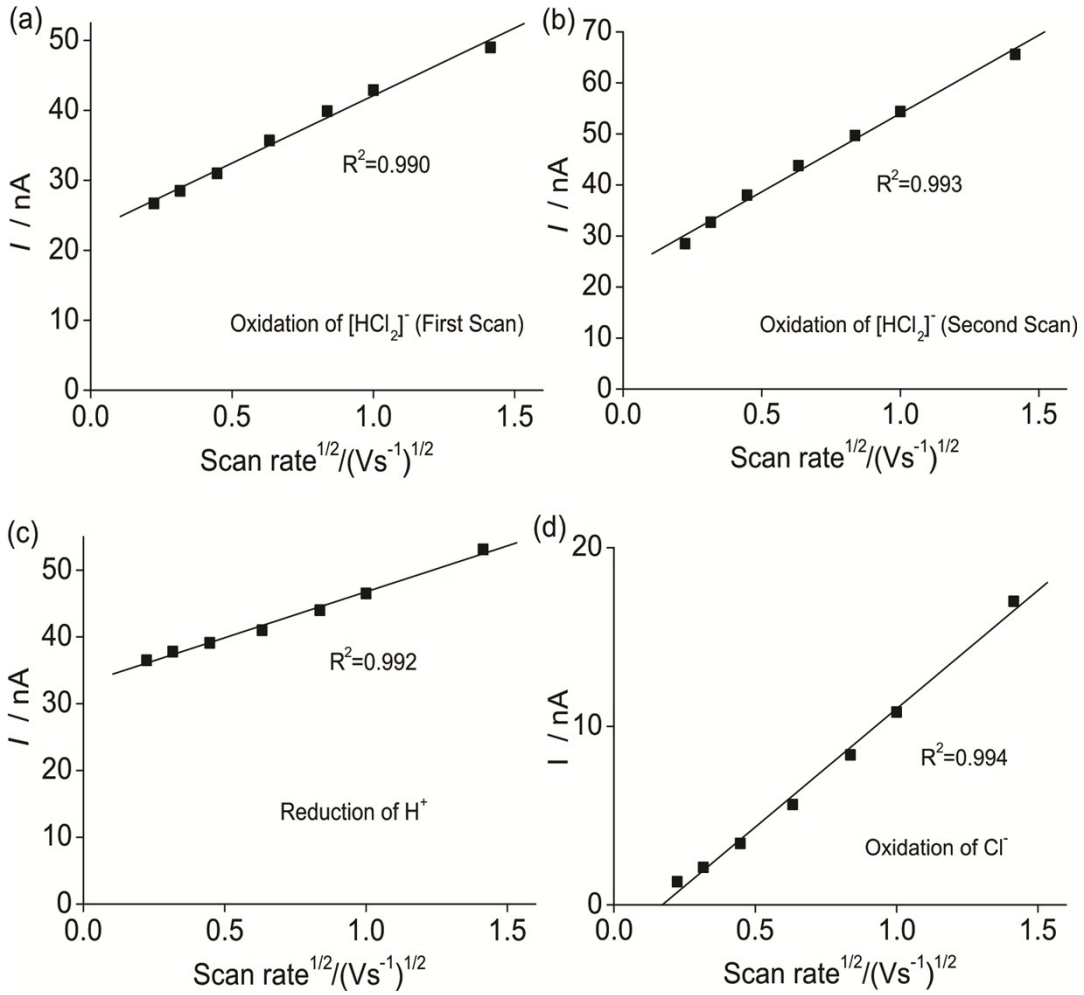

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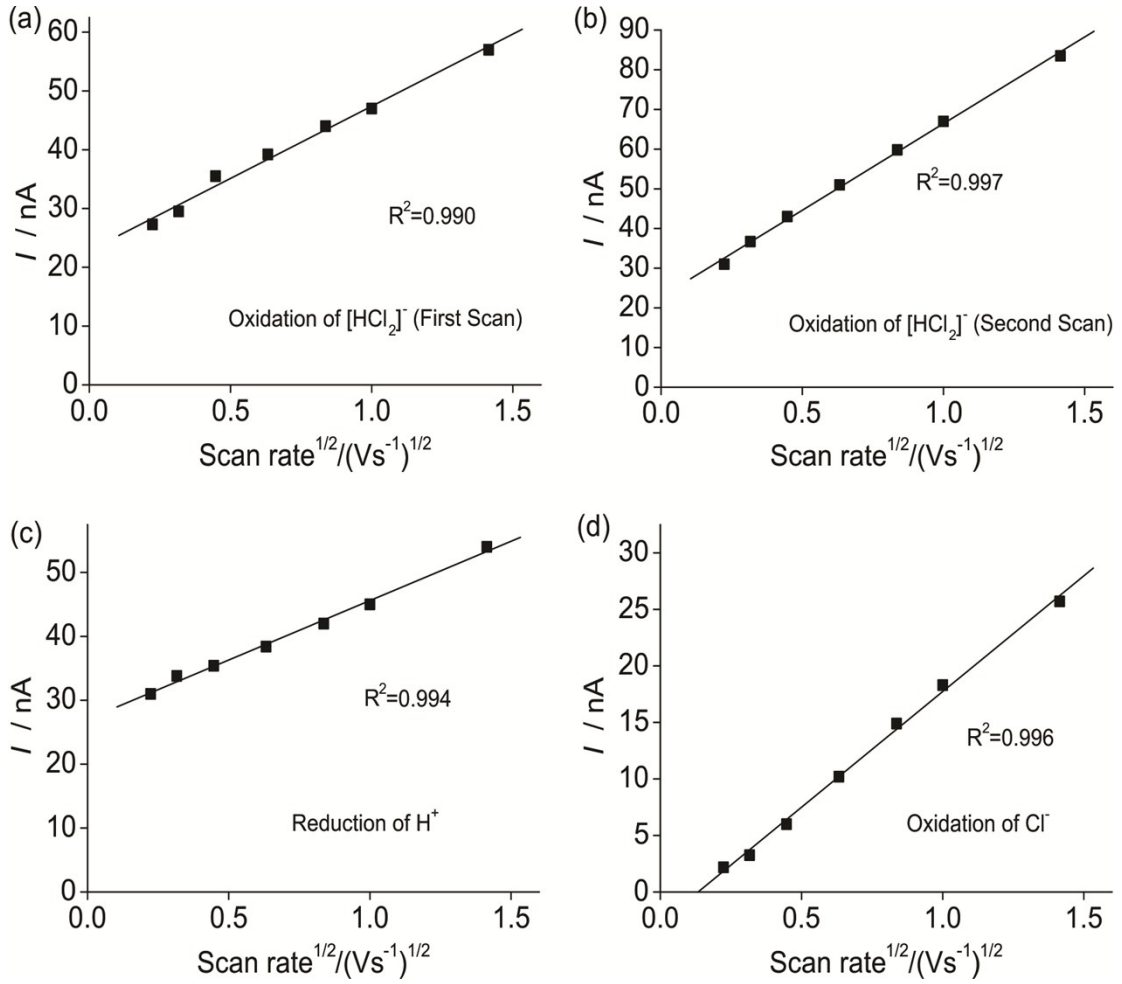

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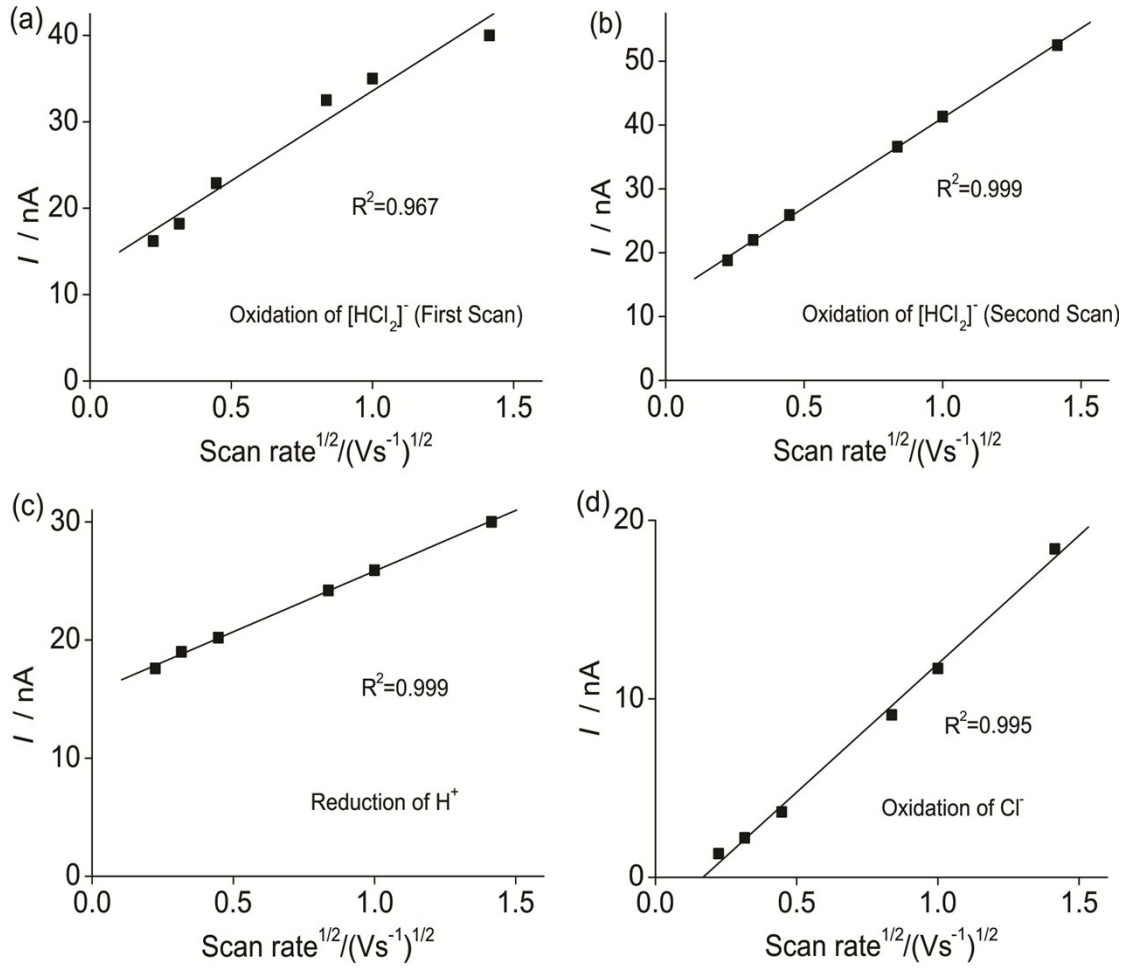

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