

Supporting Information

Study on the Behavior of Halide Ions on the Au(111) Electrode Surface in Ionic Liquids Using Surface X-ray Scattering

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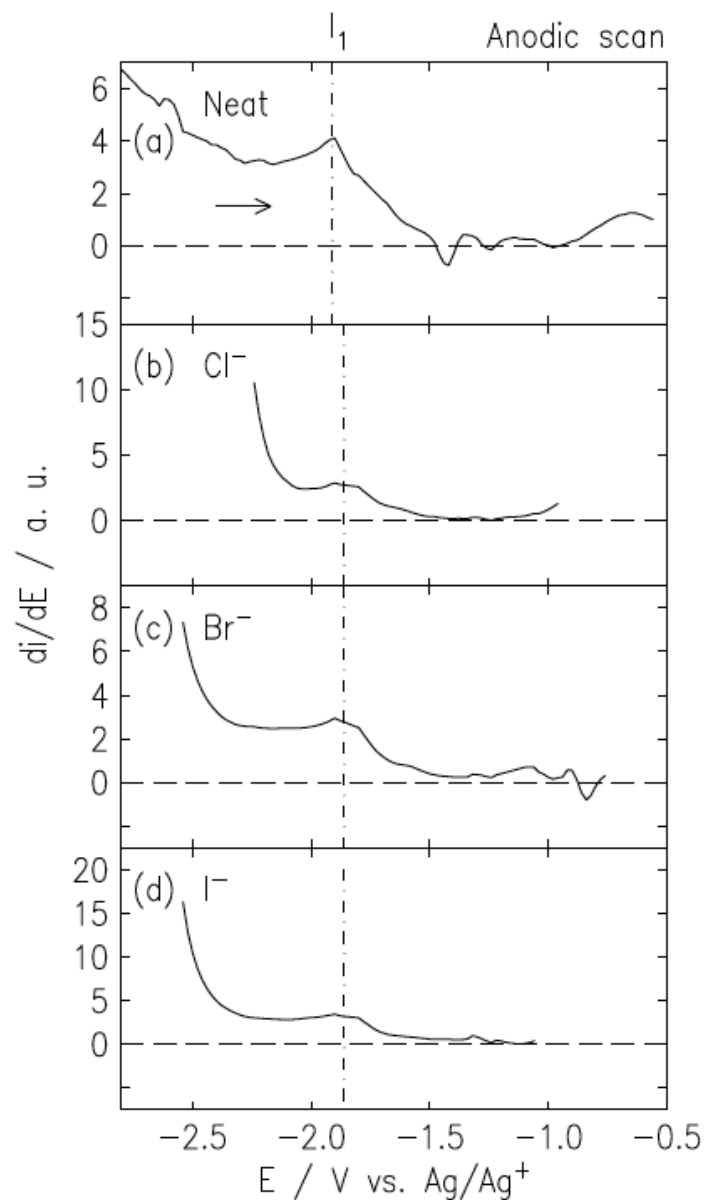


Figure S1. Differentials of current values in anodic scan in (a) neat [BMP]TFSA and [BMP]TFSA containing 2 mM (b) Cl^- , (c) Br^- , and (d) I^- . In anodic scan, no current peak was observed; however, an inflection point was observed. It is shown as I_1 . I_1 did not show ion species dependence.

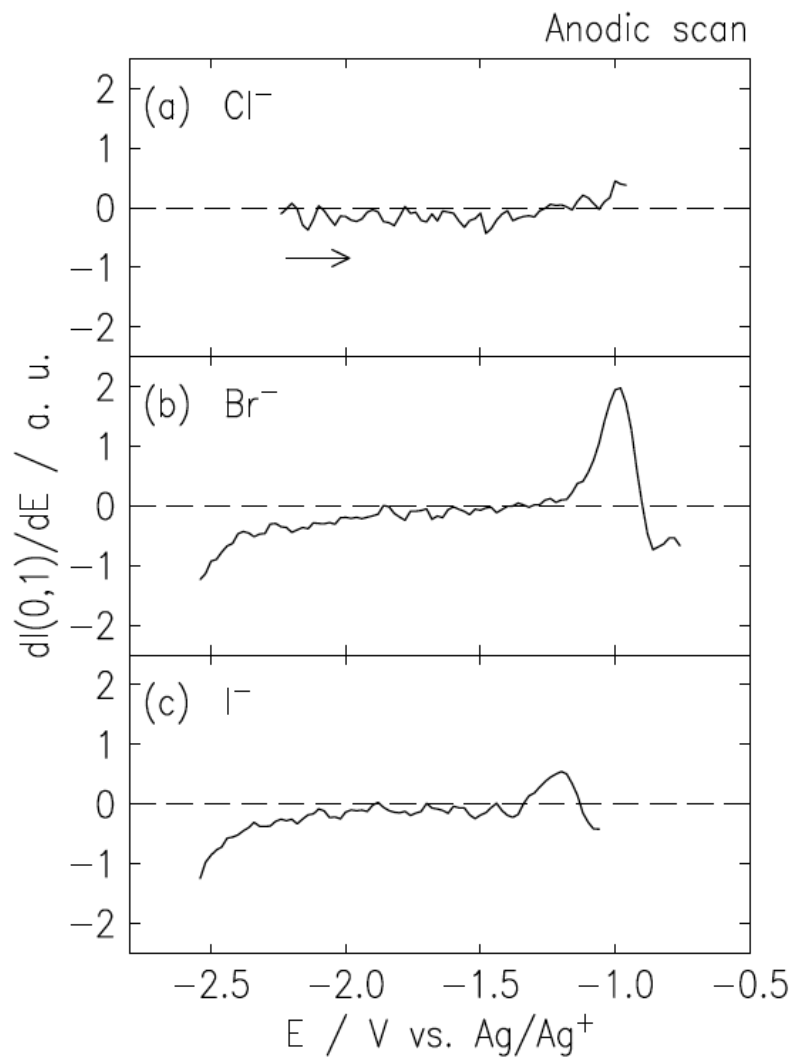


Figure S2. Differentials of X-ray intensity at (0, 1) in anodic scan in [BMP]TFSA containing 2 mM (a) Cl^- , (b) Br^- , and (c) I^- . In the three differentials, no common behavior was observed.

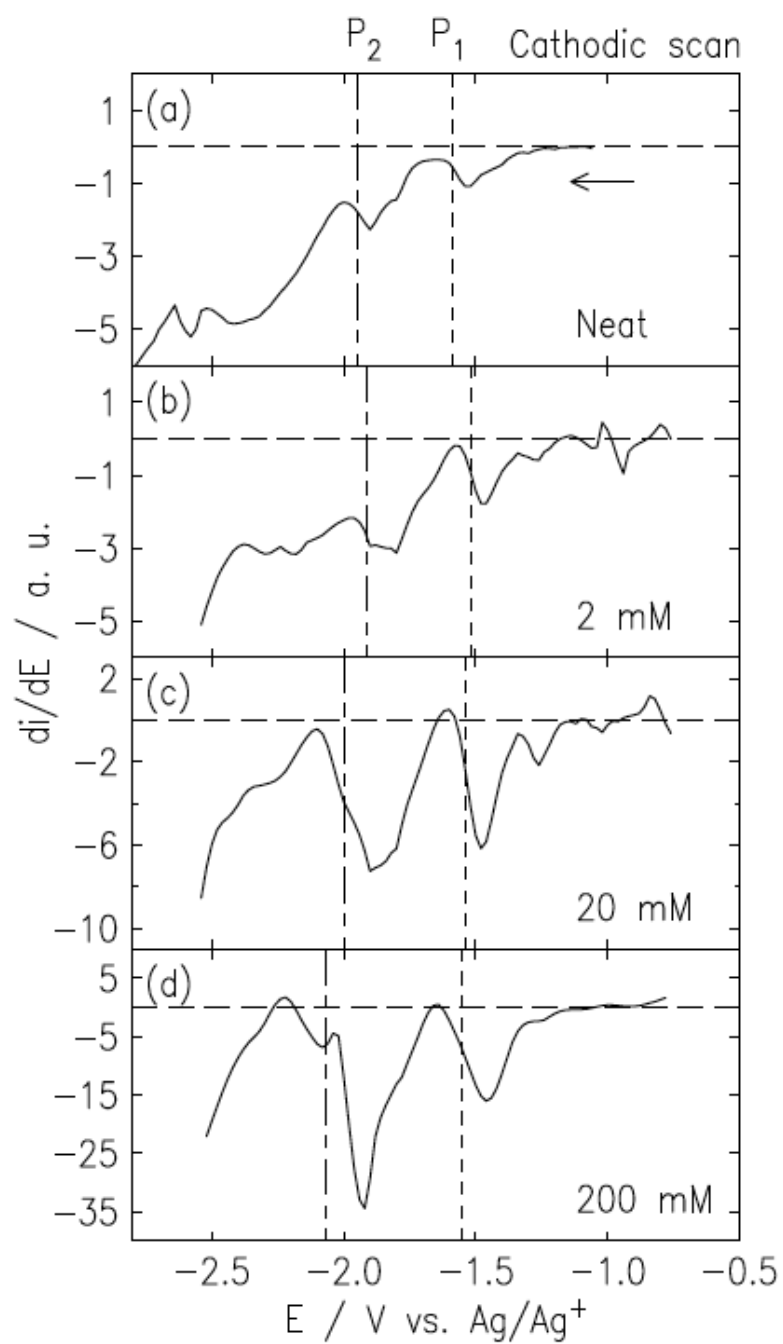


Figure S3. Differentials of current values in cathodic scan in $[\text{BMP}]\text{TFSA}$ containing Br^- : (a) 2 mM, (b) 20 mM, and (c) 200 mM. Two current peaks were observed in CVs. They are shown as P_1 and P_2 . Only P_2 showed the concentration dependence.

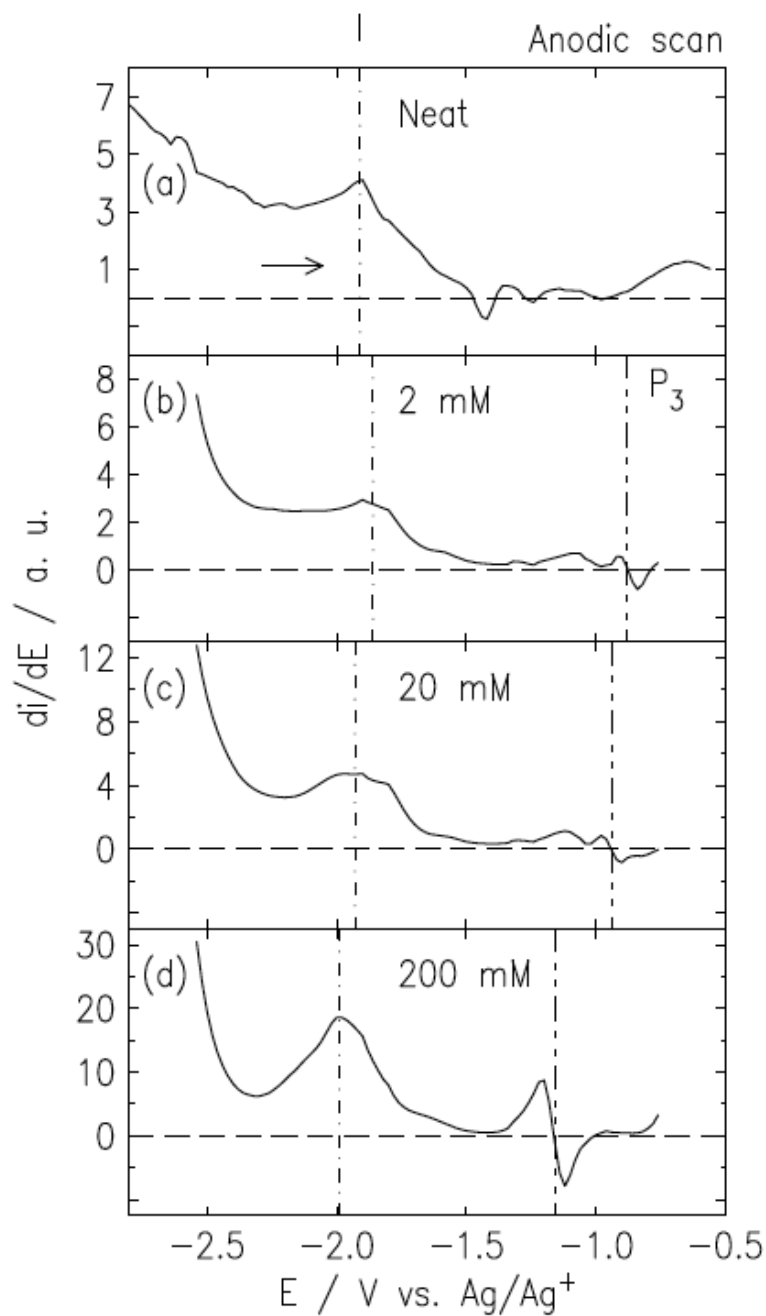


Figure S4. Differentials of current values in anodic scan in [BMP]TFSA containing Br^- : (a) 2 mM, (b) 20 mM, and (c) 200 mM. An inflection point and a peak were observed. The inflection point is shown as I . The Current peak is shown as P_3 . Both I and P_3 show concentration dependence.

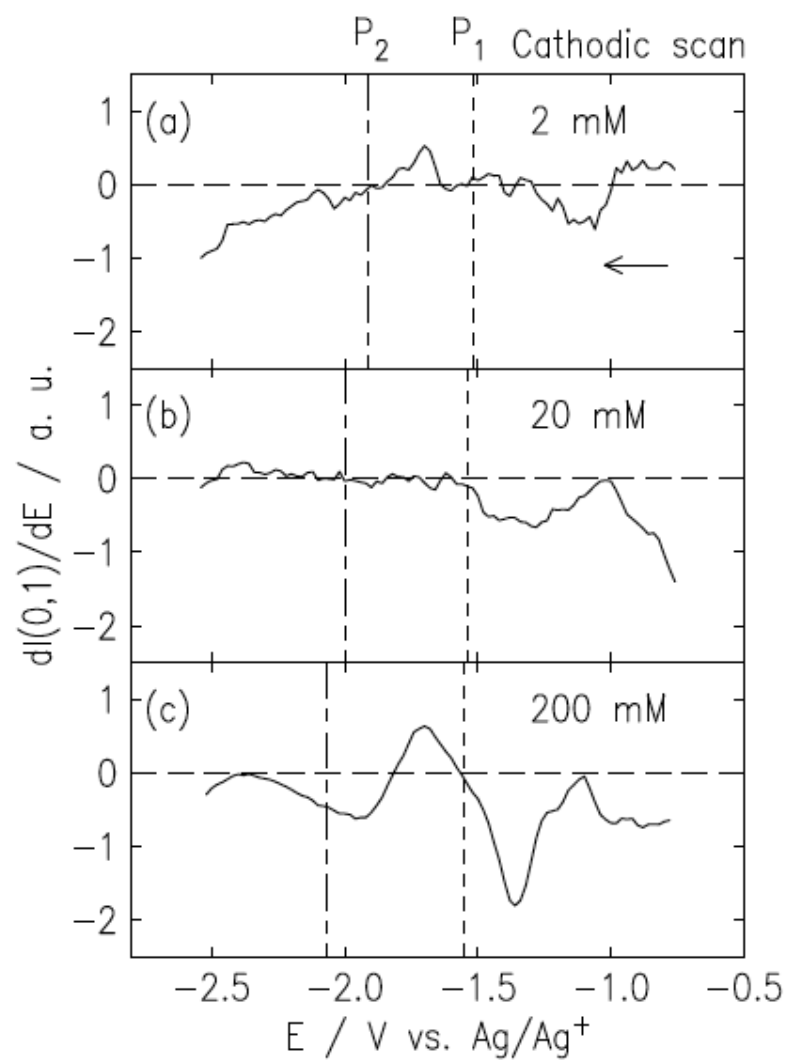


Figure S5. Differentials of X-ray intensity at (0, 1) in cathodic scan in [BMP]TFSA containing Br^- : (a) 2 mM, (b) 20 mM, and (c) 200 mM. Peak positions are shown as P_1 and P_2 . Common behavior was not clearly observed.

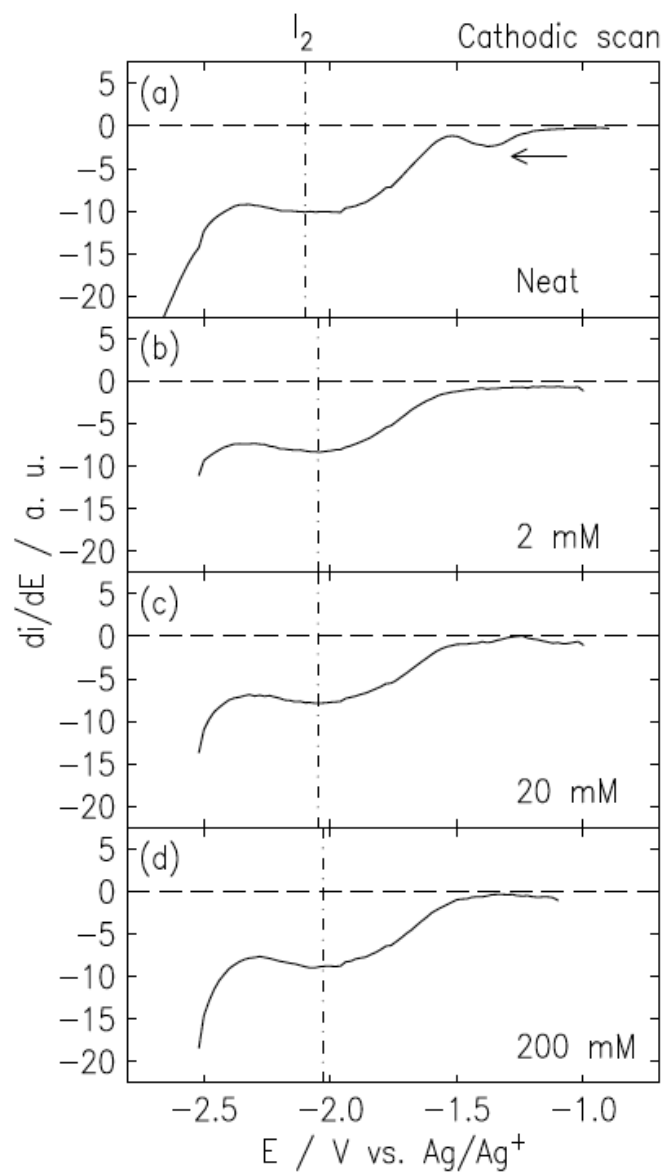


Figure S6. Differentials of current values in cathodic scan in [BMIM]TFSA containing Br^- : (a) 2 mM, (b) 20 mM, and (c) 200 mM. An inflection point is shown as I_2 . In [BMIM]TFSA no concentration dependence was observed in I_2 .

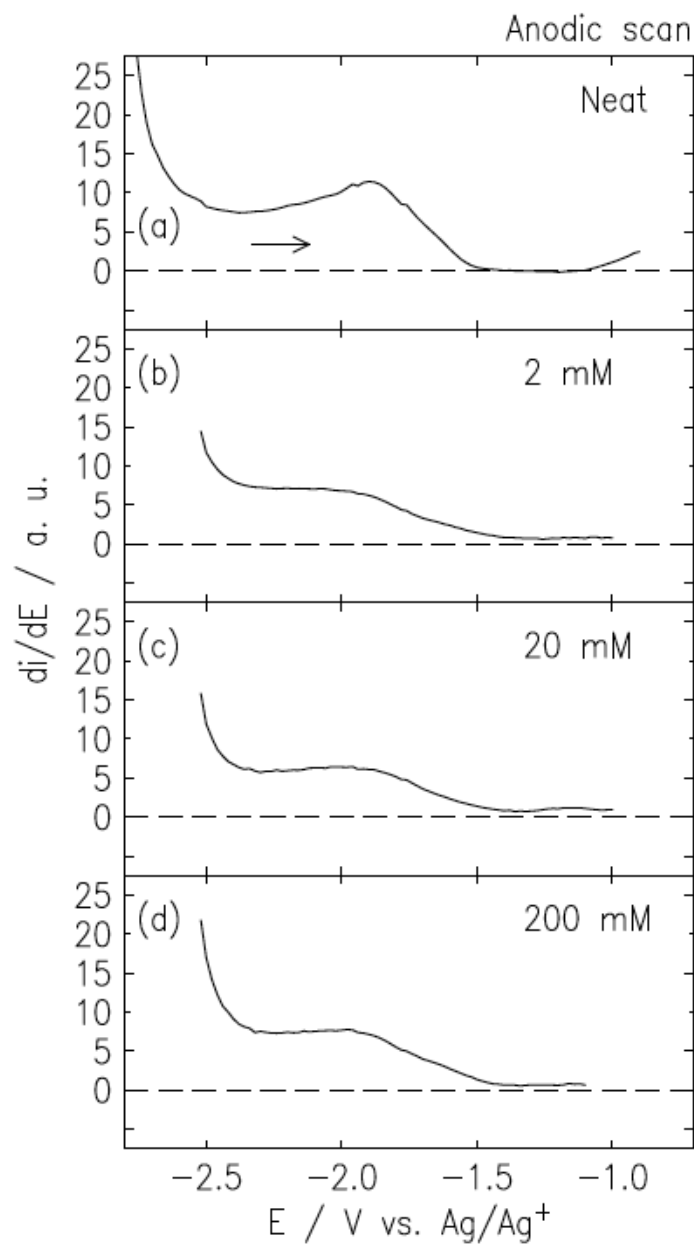


Figure S7. Differentials of current values in anodic scan in [BMIM]TFSA containing Br^- : (a) 2 mM, (b) 20 mM, and (c) 200 mM. As seen in the cathodic scan (Fig. S6), no concentration dependence was observed in the anodic scan.

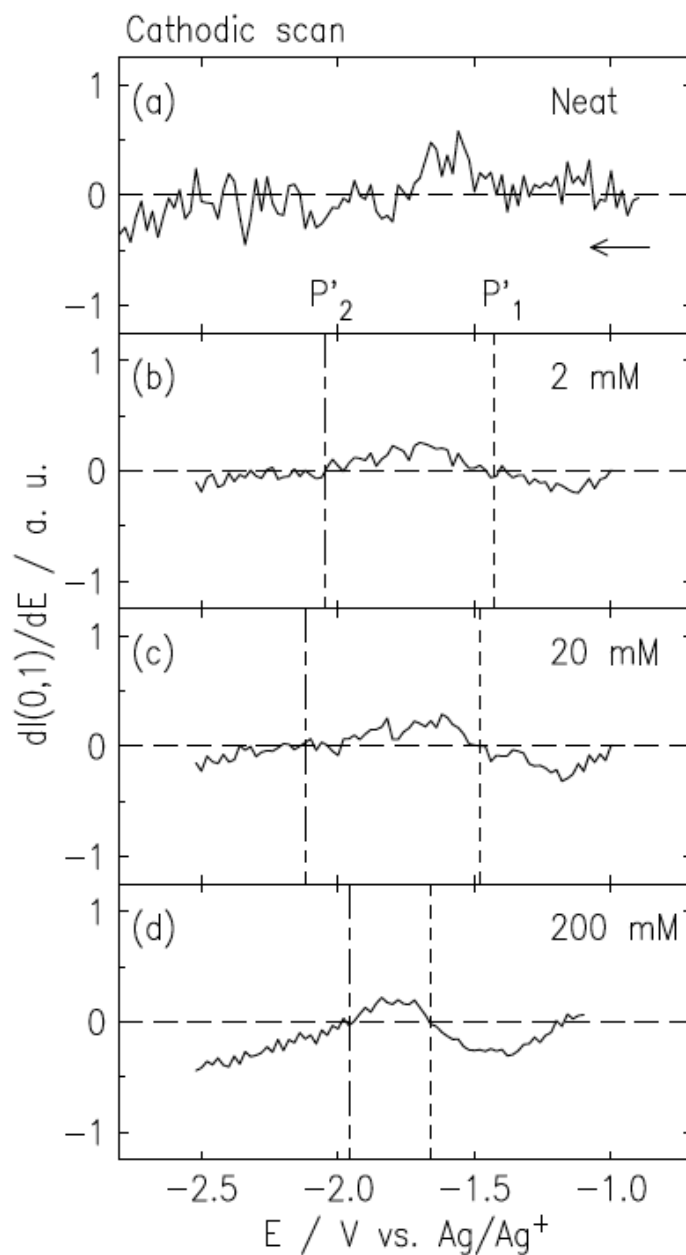


Figure S8. Differentials of X-ray intensity at (0, 1) in cathodic scan in [BMIM]TFSA containing Br^- : (a) 2 mM, (b) 20 mM, and (c) 200 mM. Peak positions are indicated by P'_1 and P'_2 . Strong concentration dependence was observed in the P'_1 and P'_2 .

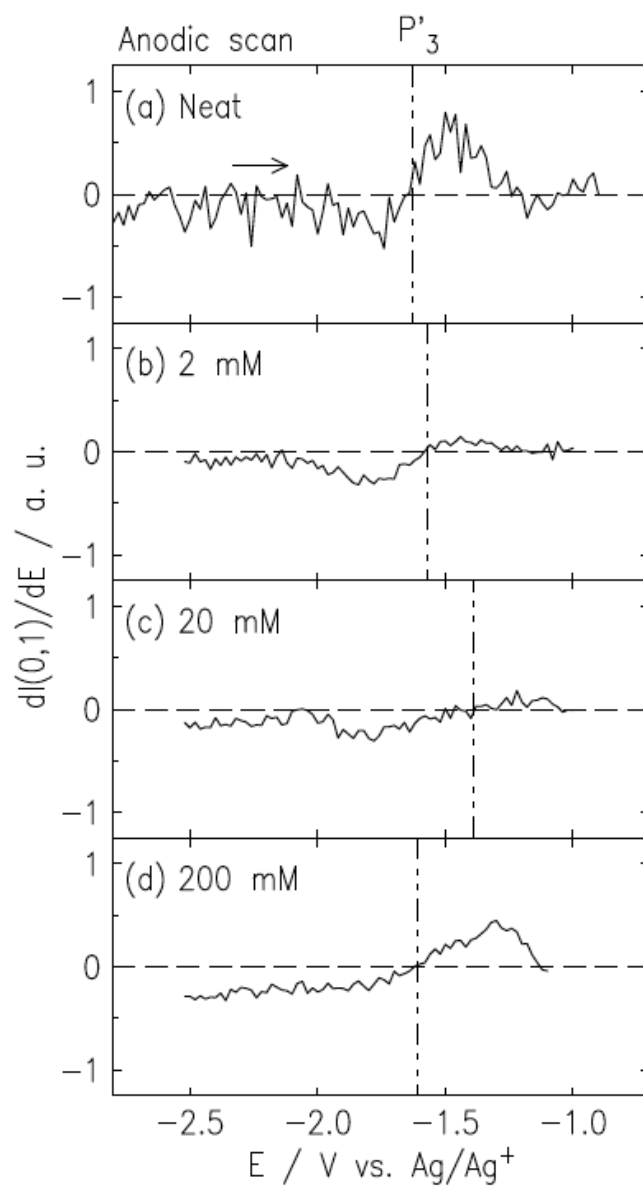


Figure S9. Differentials of X-ray intensity at (0, 1) in anodic scan in [BMIM]TFSa containing Br^- : (a) 2 mM, (b) 20 mM, and (c) 200 mM. A Peak position is indicated by P'_3 . As seen in Figure S8, strong concentration dependence of in the P'_3 and the common behavior of the intensity at (0,1) were observed.