

Supporting Information

Halide Anion–Fullerene π Noncovalent Interactions: *n*-Doping and Halide Anion Migration Mechanism in *p-i-n* Perovskite Solar Cells

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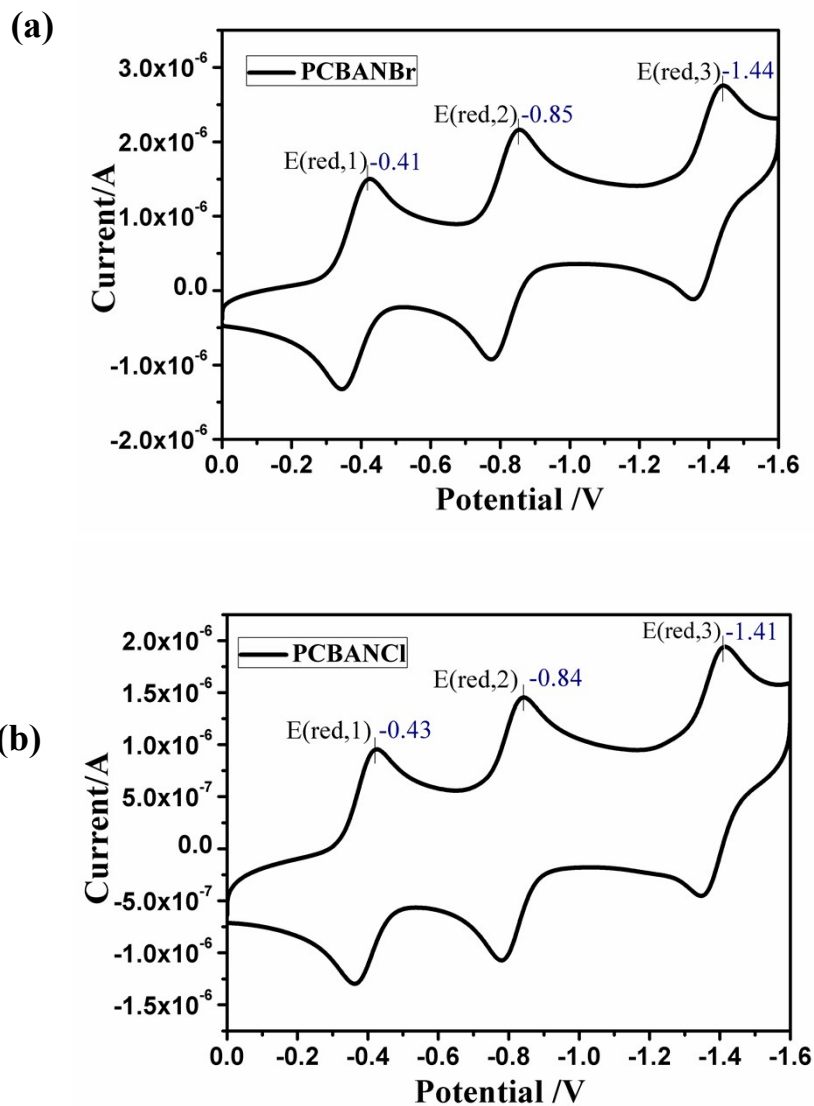


Fig. S1 Cyclic voltammogram of PCBANBr (a) and PCBANCl (b) (1.33×10^{-4} M) in BMIH (1.23×10^{-2} M, supporting electrolyte) DMSO solution under nitrogen atmosphere at a scan rate of 0.05 V/s.

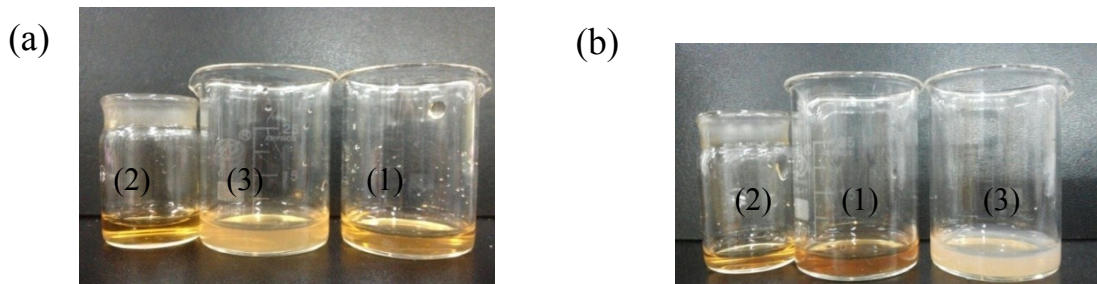


Fig. S2 AgBr and AgCl precipitation test respectively for the generation of Br^- and Cl^- during electrochemical reduction (in the absence of support electrolyte BMIH) of PCBANBr (a) and PCBANCl (b) DMSO aqueous solution. The results indicated that partial oxidation of Br^- and Cl^- occurred due to the n-doping and that Br^- and Cl^- were dissolved in the solution during reduction.

(Left) PCBANBr DMSO aqueous solution: (1) added AgNO_3 aqueous solution before electrochemical reduction as a control. (2) after electrochemical reduction. (3) AgI precipitation generated when added AgNO_3 aqueous solution to the electrolyte solution.

(Right) PCBANCl DMSO aqueous solution: (1) added AgNO_3 aqueous solution before electrochemical reduction as a control. (2) after electrochemical reduction. (3) AgI precipitation generated when added AgNO_3 aqueous solution to the electrolyte solution.

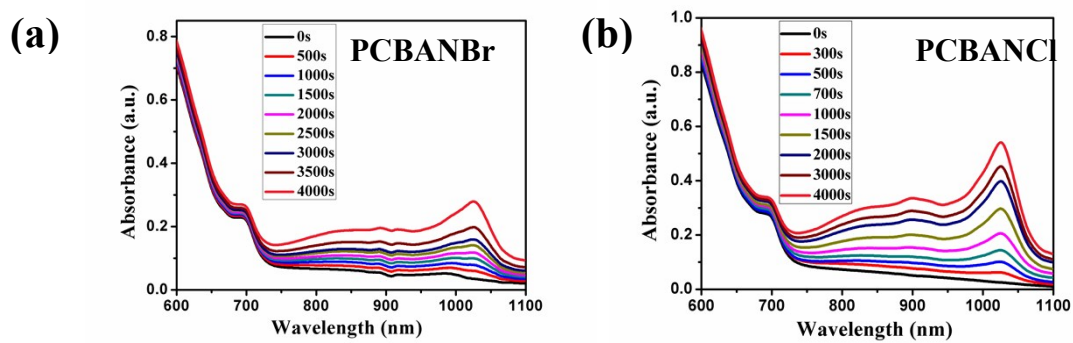


Fig. S3 *In situ* UV-vis-NIR absorption spectra of PCBANBr (a) and PCBANCl (b) at different times during the reduction (1.33×10^{-4} M PCBANI 1.84×10^{-2} M BMIH in deoxygenated super dry DMSO using a Pt wire working electrode) at -0.60 V vs. SCE.

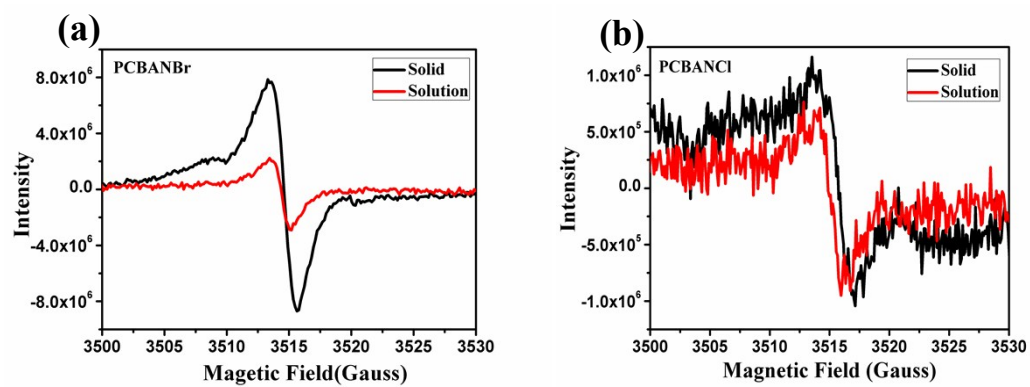


Fig. S4 EPR measurements of PCBANBr (a) and PCBANCl (b).