

**Supporting Information:**

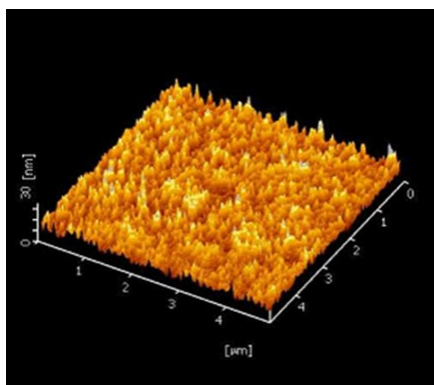
# Metallophthalocyanine Derivatives Utilized as Cathode Interlayers for the Polymer Solar Cells: a Practical Approach to Prepare the Uniform Film

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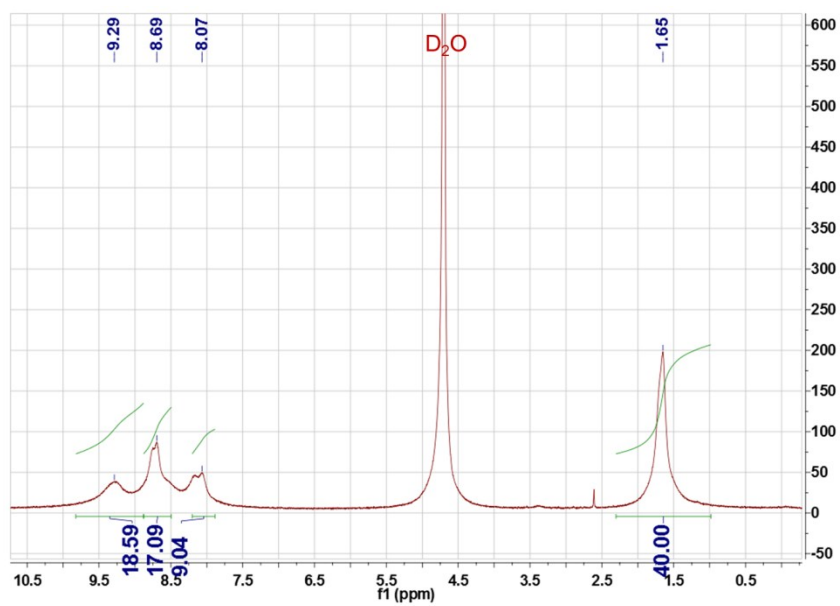
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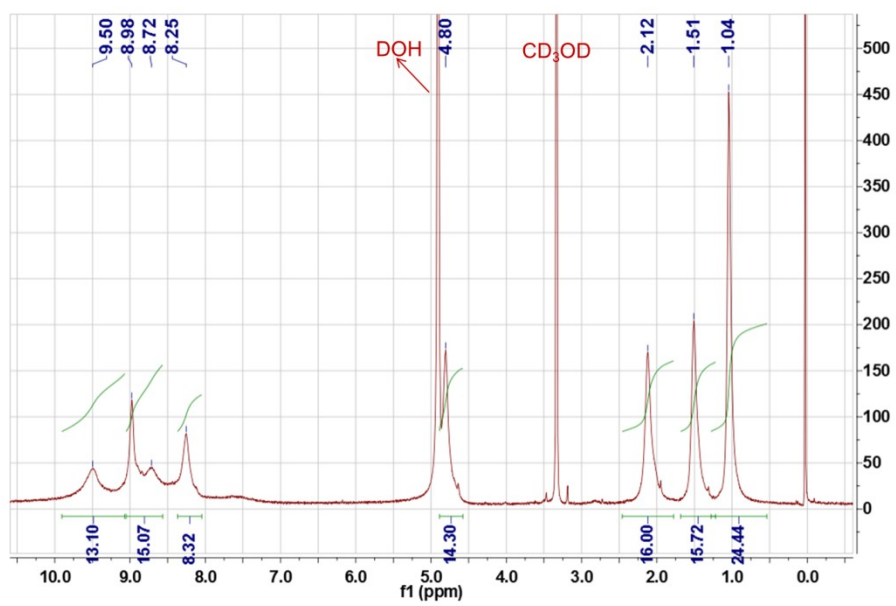
Changchun 130012, P. R. China



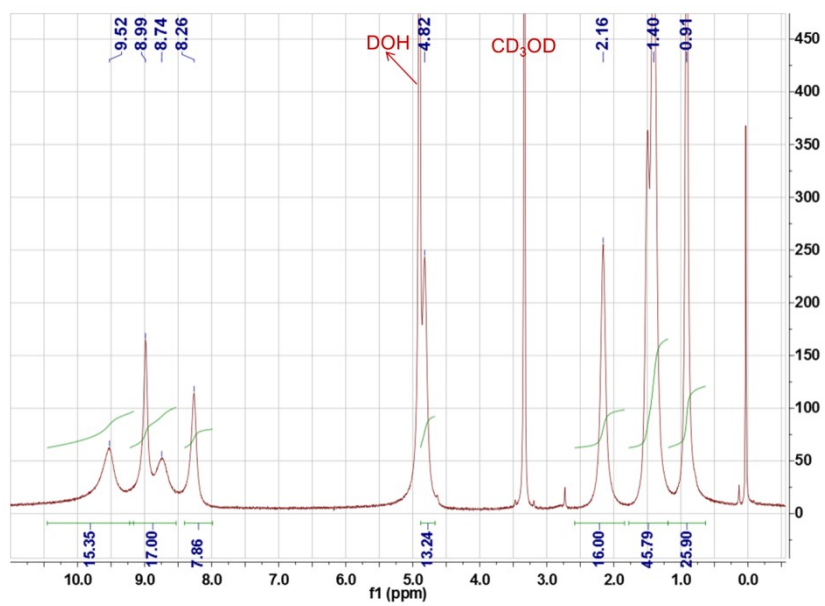
**Figure S1.** AFM image of PFN on PTB7:PC<sub>71</sub>BM BHJ film.



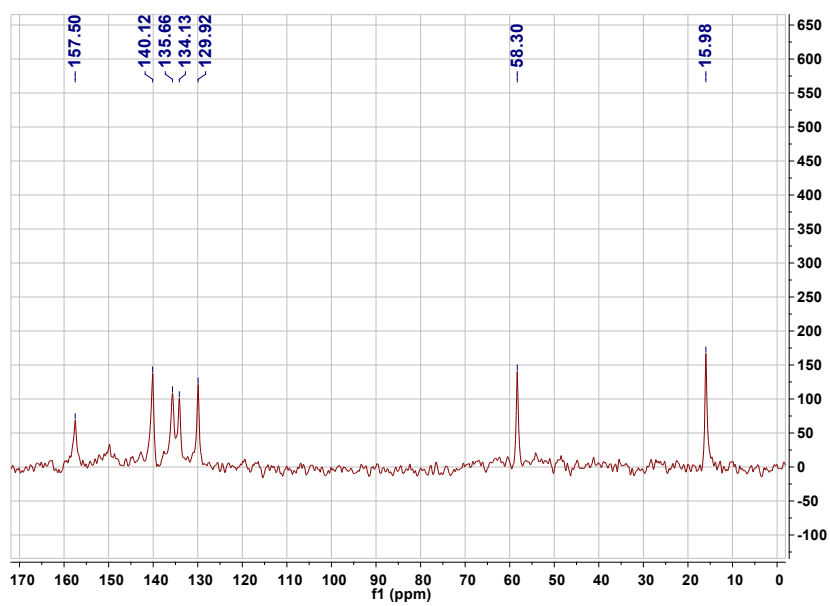
**Figure S2.**  $^1\text{H}$  NMR spectrum of  $\text{VOPc}(\text{OPyC}_2\text{H}_5\text{Br})_8$ .



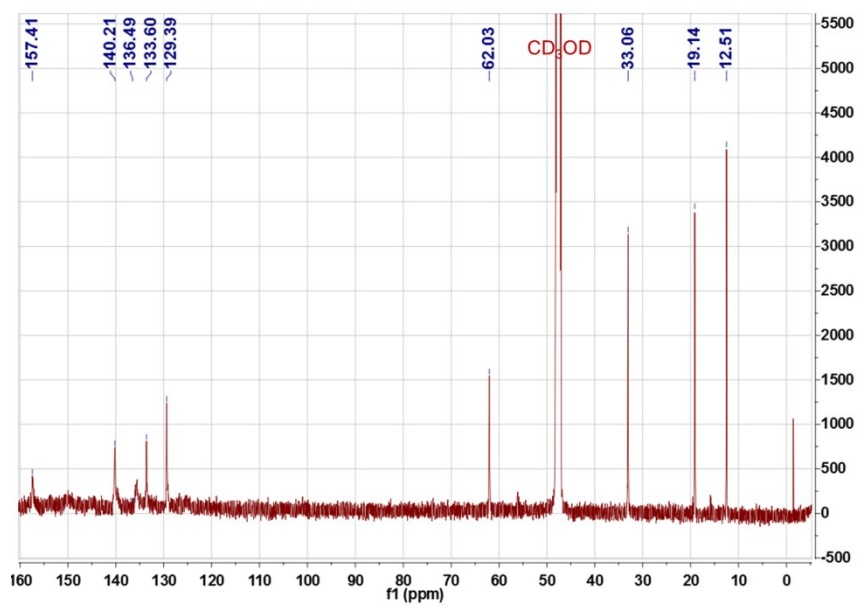
**Figure S3.**  $^1\text{H}$  NMR spectrum of  $\text{VOPc}(\text{OPyC}_4\text{H}_9\text{Br})_8$



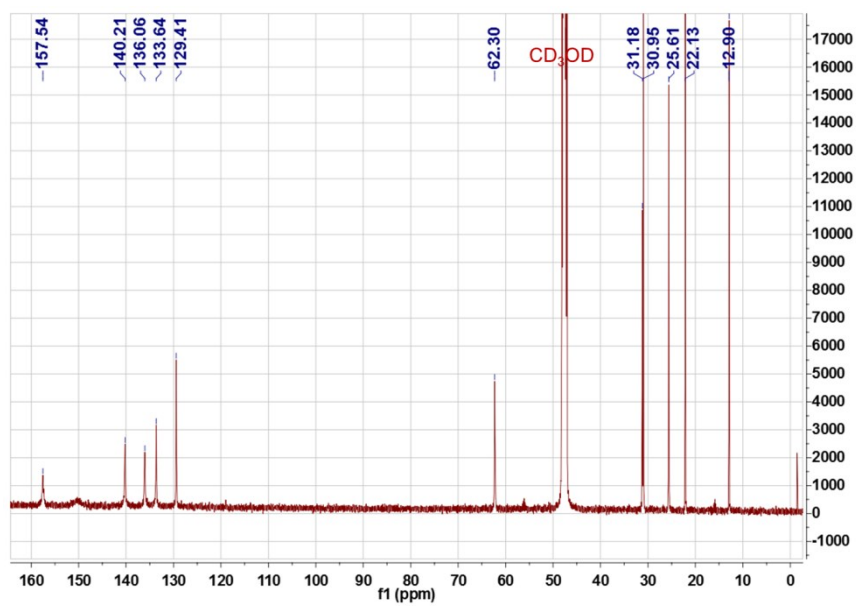
**Figure S4.**  $^1\text{H}$  NMR spectrum of  $\text{VOPc}(\text{OPyC}_6\text{H}_{13}\text{Br})_8$



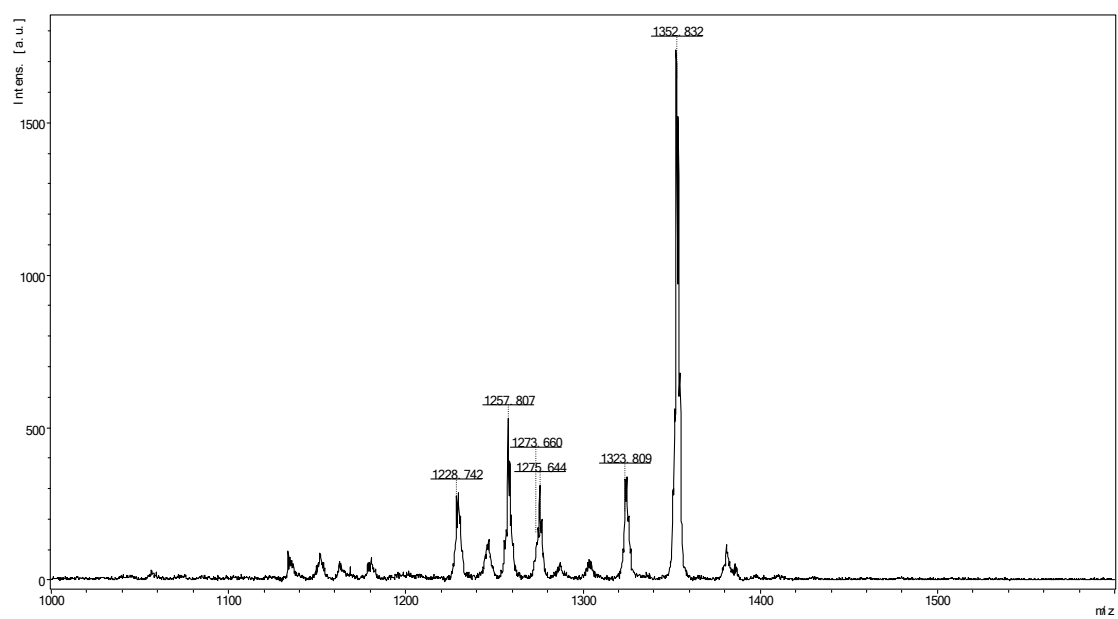
**Figure S5.**  $^{13}\text{C}$  NMR spectrum of  $\text{VOPc}(\text{OPyC}_2\text{H}_5\text{Br})_8$



**Figure S6.**  $^{13}\text{C}$  NMR spectrum of  $\text{VOPc}(\text{OPyC}_4\text{H}_9\text{Br})_8$

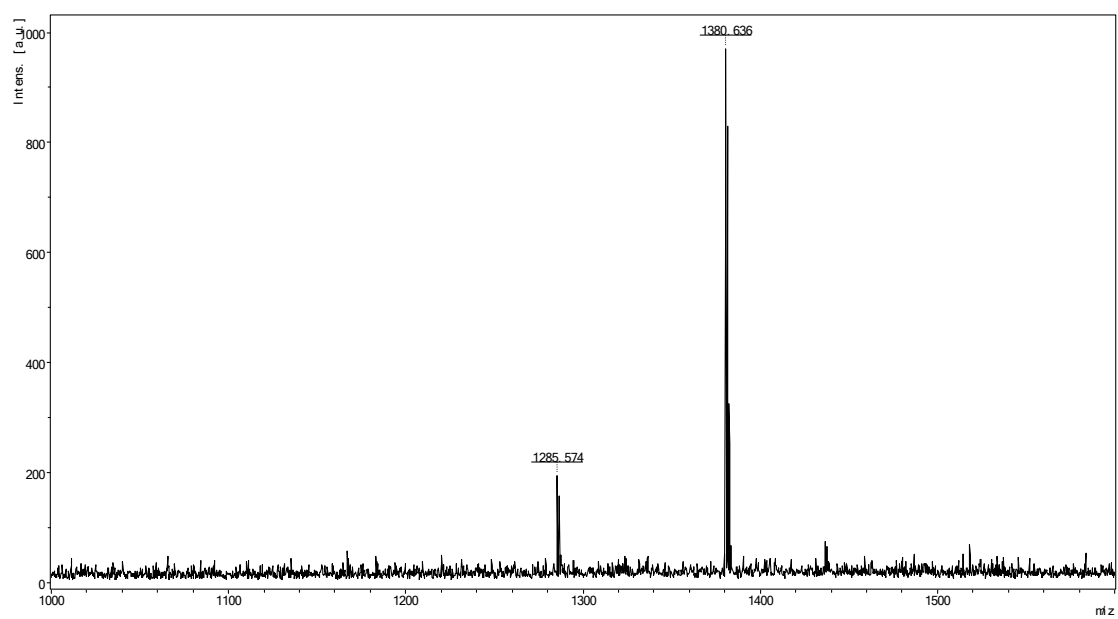


**Figure S7.**  $^{13}\text{C}$  NMR spectrum of  $\text{VOPc}(\text{OPyC}_6\text{H}_{13}\text{Br})_8$

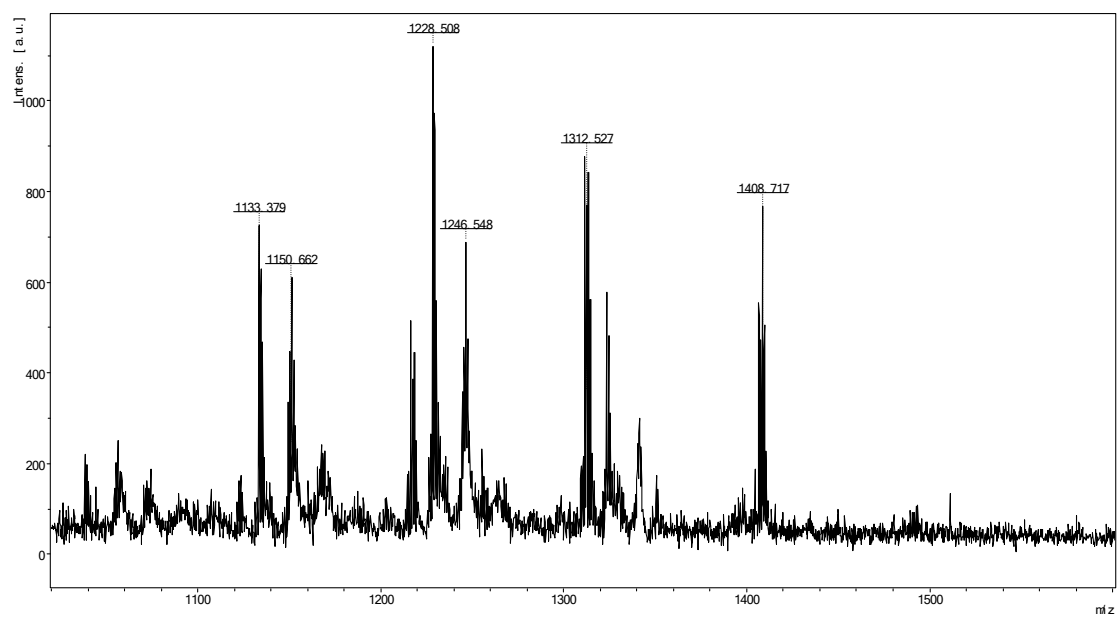


**Figure S8.** MALDI-TOF mass spectrum of VOPc(OPyC<sub>2</sub>H<sub>5</sub>Br)<sub>8</sub>





**Figure S9.** MALDI-TOF mass spectrum of VOPc(OPyC<sub>4</sub>H<sub>9</sub>Br)<sub>8</sub>



**Figure S10.** MALDI-TOF mass spectrum of VOPc(OPyC<sub>6</sub>H<sub>13</sub>Br)<sub>8</sub>