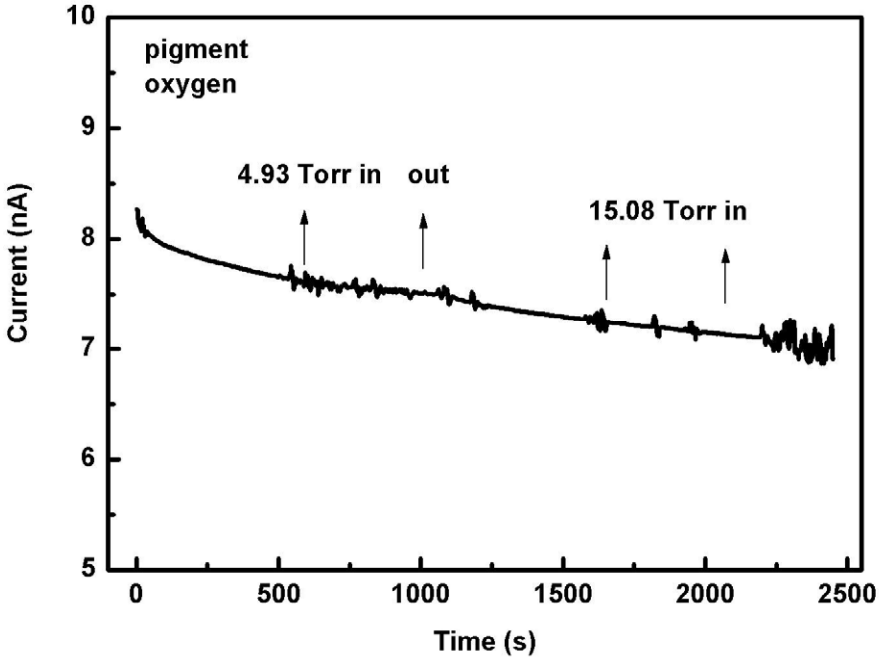
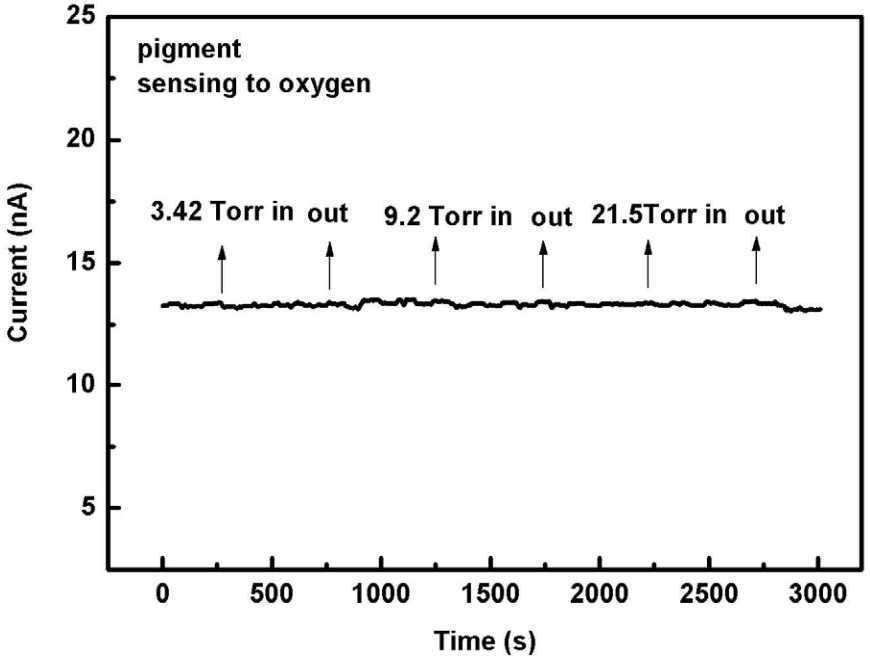
# Supporting information




The oxygen-sensing of azo pigment without irradiation of 370 nm light is revealed. Various partial pressures of oxygen injections and extractions are shown by arrows.

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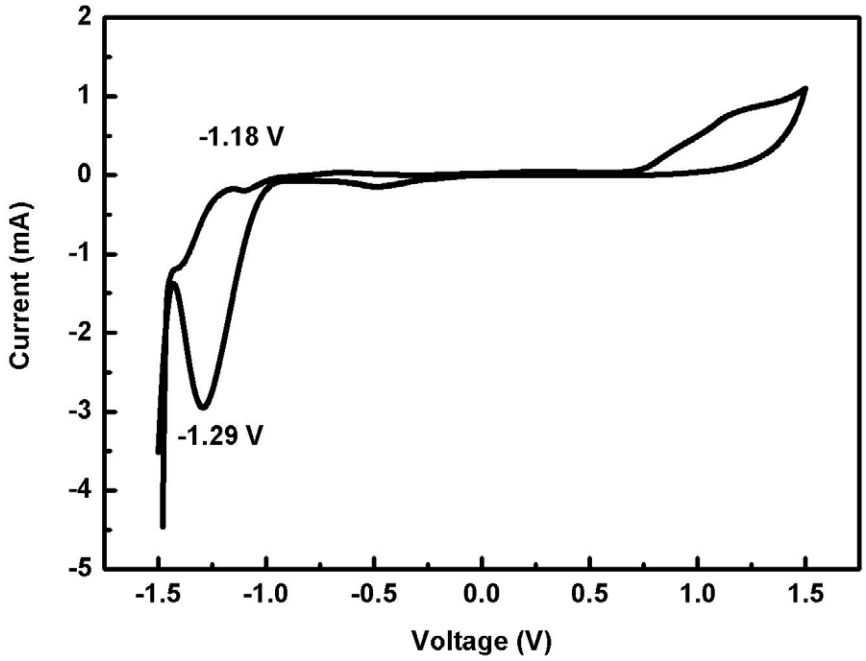
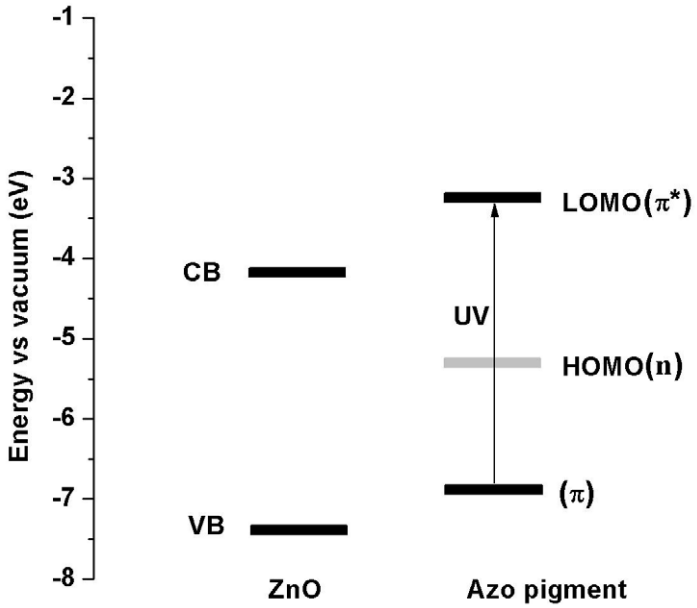



Cyclic voltammetry curve of azo pigment in the solution of DMF with 0.2 mol/L TBAP.

The reduction potential of azo pigment is -1.47 V vs NHE (-1.23 V vs Ag/AgCl). The reduction potential of azo pigment is corresponding to its LUMO, whose energy level is -3.2 eV (vs vacuum). Actually, the LUMO also is the π∗ orbit.




Under the UV light (370 nm) irradiation, the electrons transition is corresponding to the π – π∗ transition. The energy level of π∗ orbit is at -3.2 eV (vs vacuum ), which is higher than that of conduction band (CB) minimum of ZnO, whose energy level is at -4.2 eV (*YONG XU, MARTIN A.A. SCHOONEN, The absolute energy positions of conduction and valence bands of selected semiconducting minerals, American Mineralogist, Volume 85, pages 543–556, 2000*). Therefore, the photoexcitated electrons from the azo pigment can be filled into the CB of ZnO.