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Ferroelectric Polarization-Enhanced Charge Separation in Vanadium-doped ZnO Photoelectrochemical System

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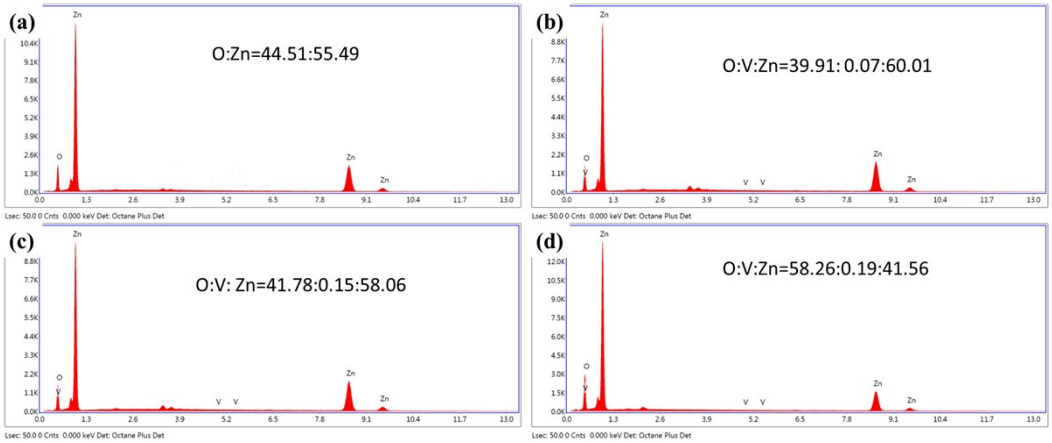

Figure S1 EDS spectrum of pure ZnO, ZnO/V-1, ZnO/V-2 and ZnO/V-4.

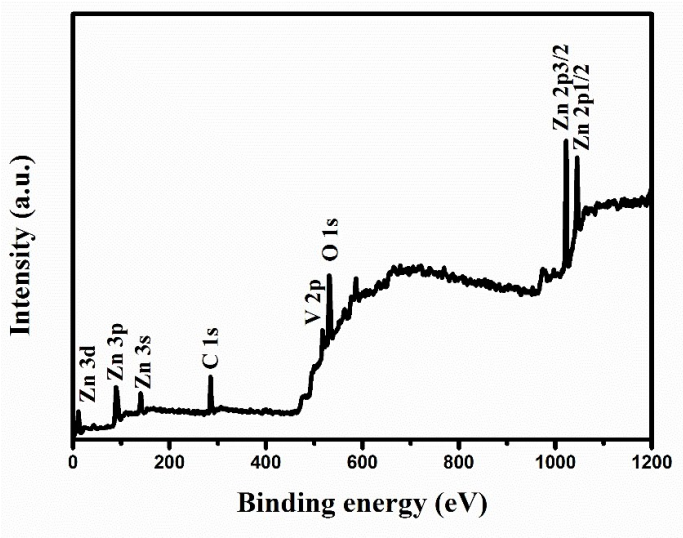

Figure S2 XPS spectra of ZnO/V-2 NRAs.

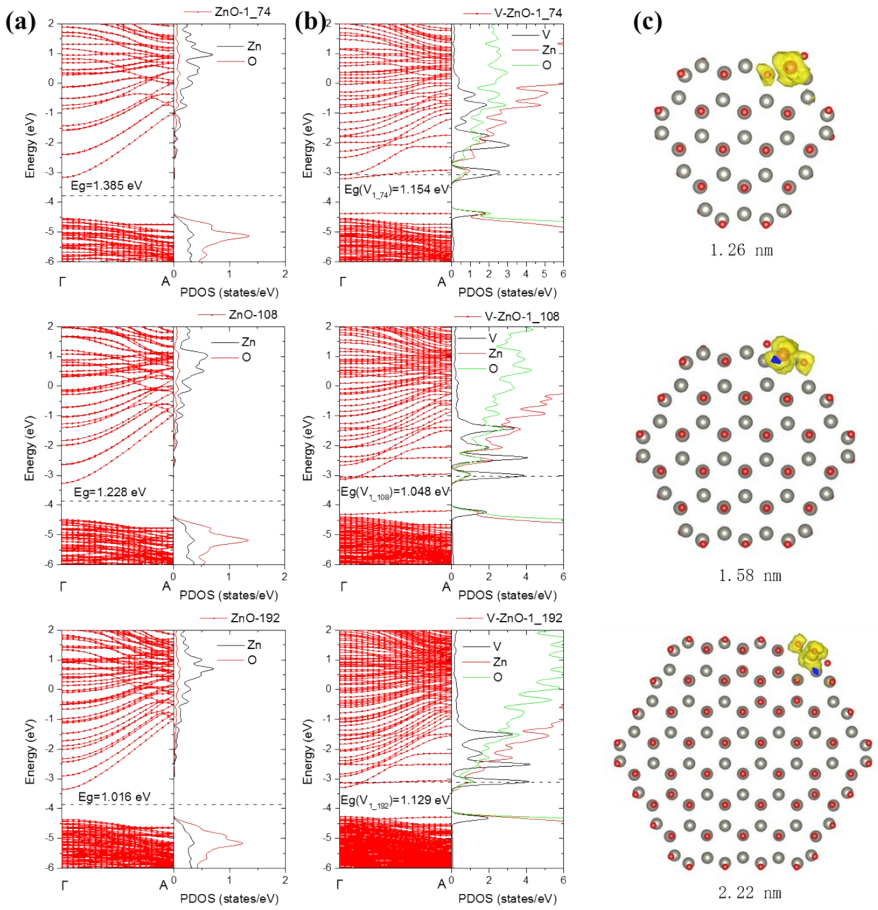

Figure S3 (a) and (b) The size dependence of band structures and partial DOS of ZnO nanowires with/without V dopants. The dash line represents the Fermi energy level in the DFT calculations. (c) The structural models of V-doped ZnO nanowires and the local charge density at the Fermi level are shown in the right side of band structures.

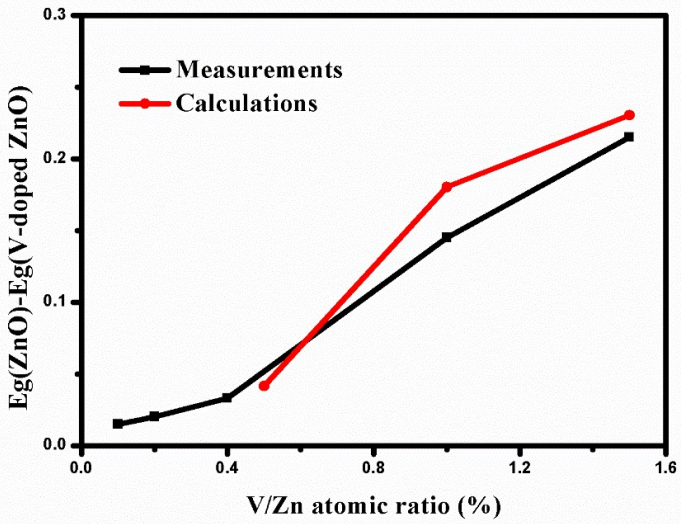

Figure S4 The difference of the band gap of ZnO and V-doped ZnO as the increasing V/Zn atomic ratio by measurement results and theoretical calculation.

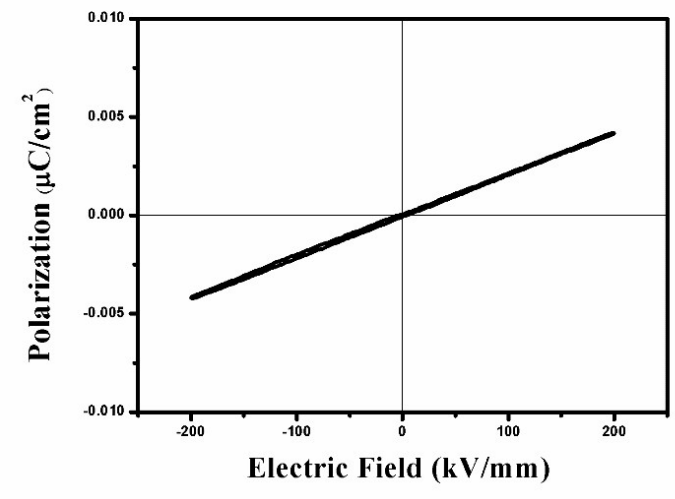

Figure S5 The P-E curve of pure ZnO nanorods array.

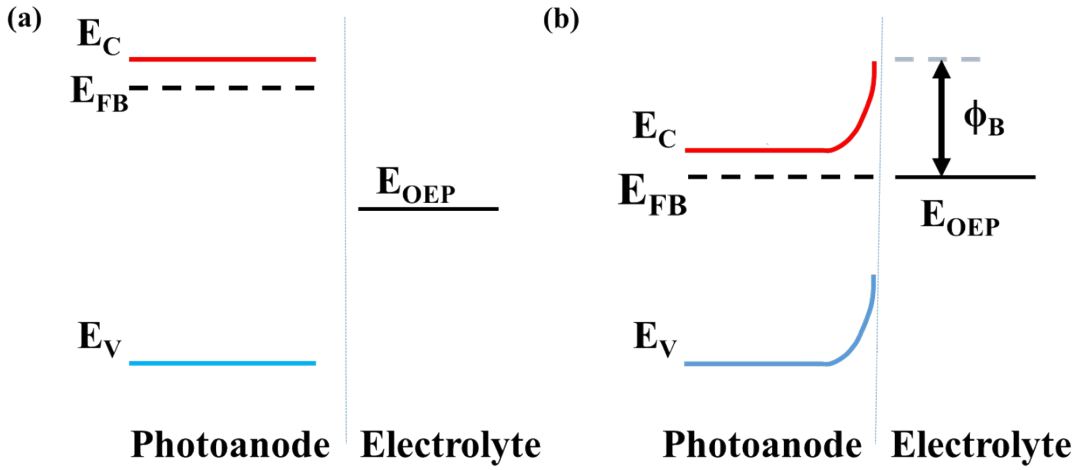

Figure S6 Energy-band diagrams of the electrodes in (a) flat band condition and (b) equilibrium conditions. E_{FB} is the flat band potential, E_C and E_V are the conduction and valence band edges of ZnO, respectively, and E_{OEP} is the oxygen evolution potential. Φ_B is the Schottky barrier height.