

Electronic Supplementary Material (ESI)·for

**Activating black phosphorene's inert basal
plane via nonprecious metal-nonmetal co-
doping for visible-light-driven photocatalytic H₂
evolution**

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Supporting information

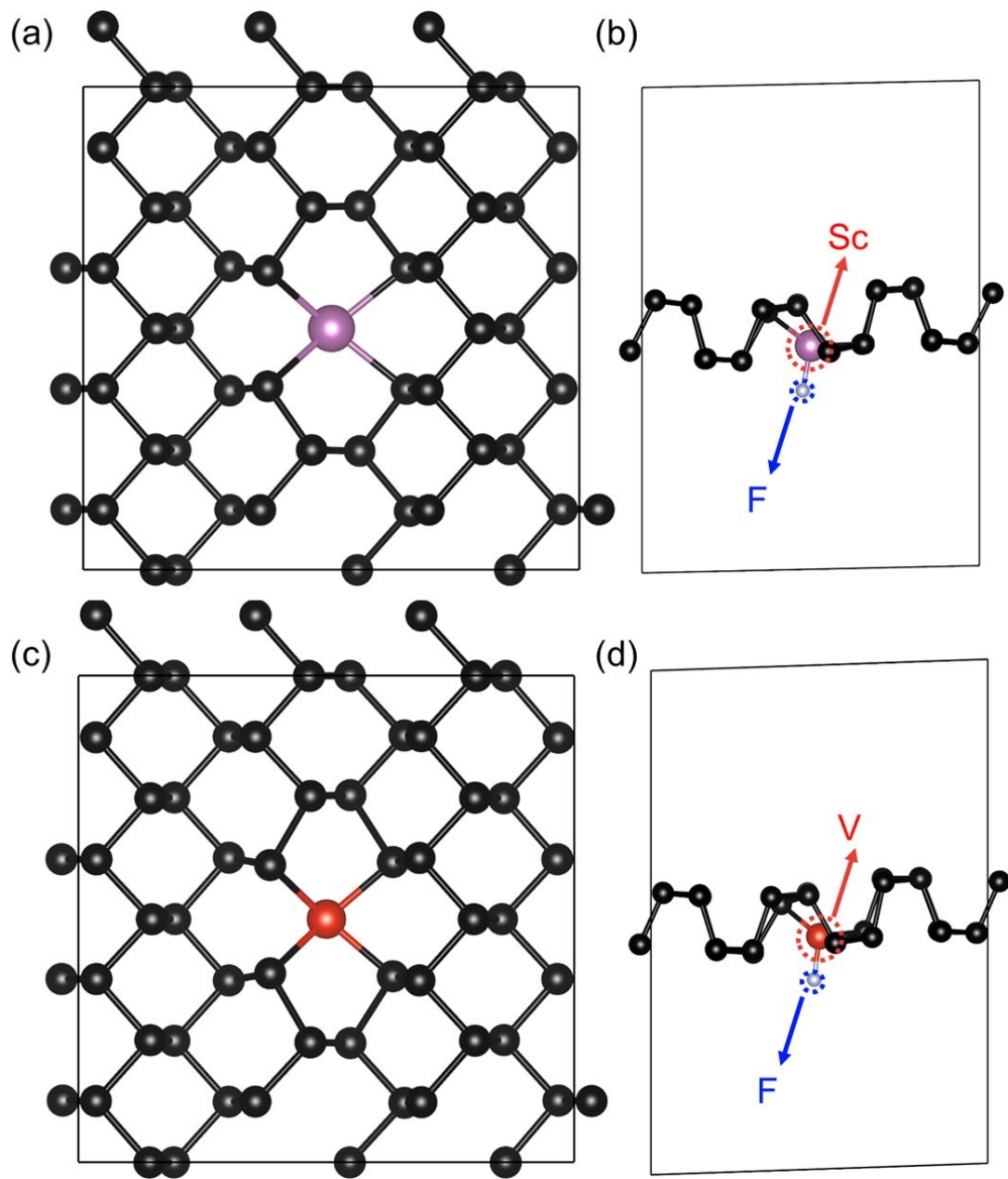


Fig S1. (a), (c) the top view of Sc-F and V-F co-doped BPs. (b), (d) the side view of Sc-F and V-F co-doped BPs.

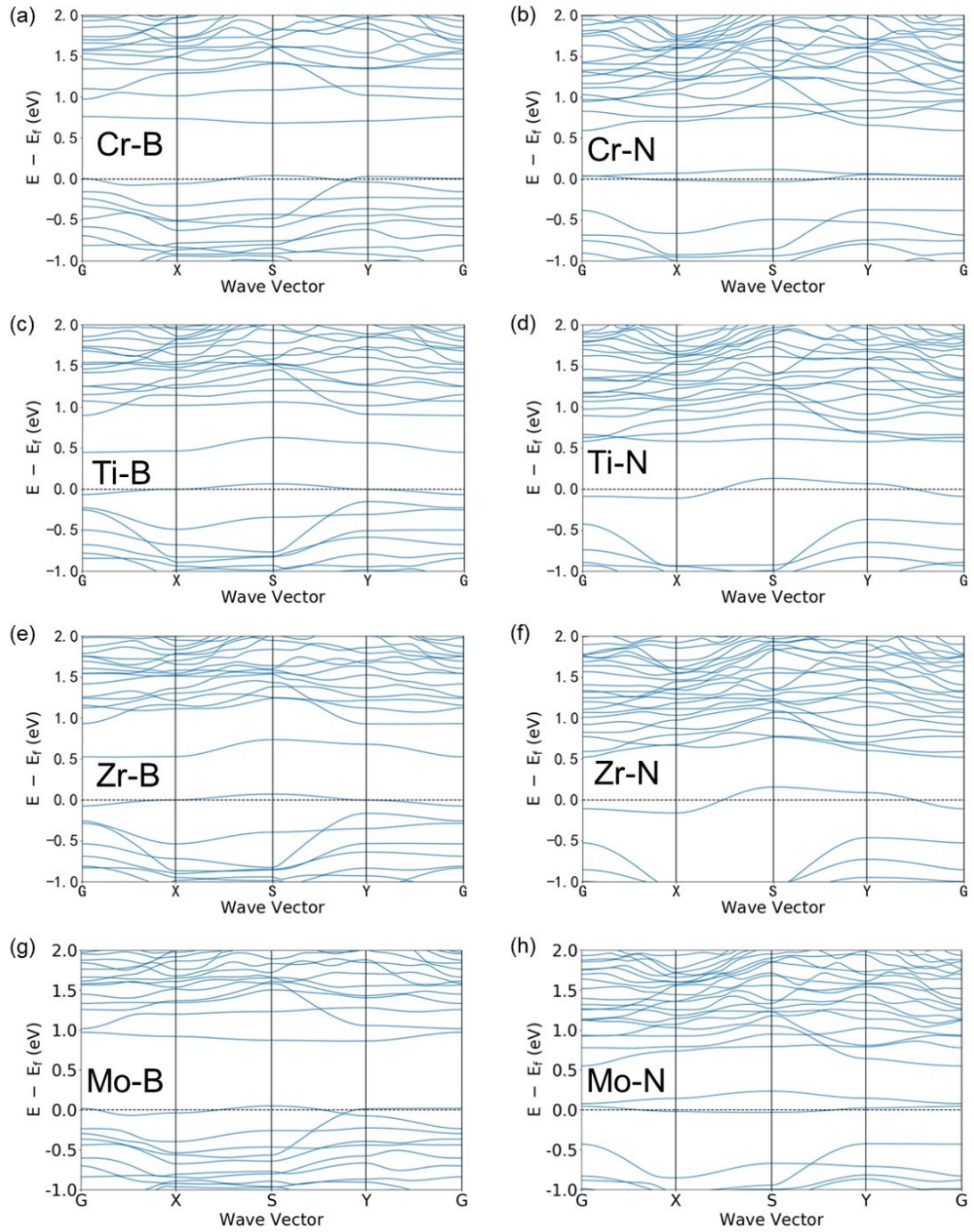


Fig S2. The PBE band structures of co-doped BPs. (a) Cr-B, (b) Cr-N, (c) Ti-B, (d) Ti-N, (e) Zr-B, (f) Zr-N, (g) Mo-B and (h) Mo-N.

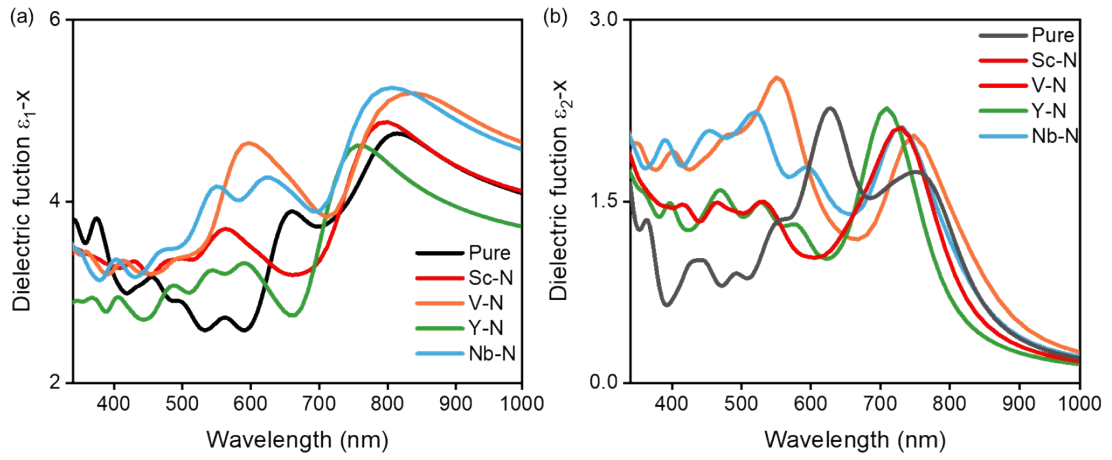


Fig S3. The (a) real and (b) imaginary parts of dielectric functions along the x direction of isoelectric co-doped BPs.

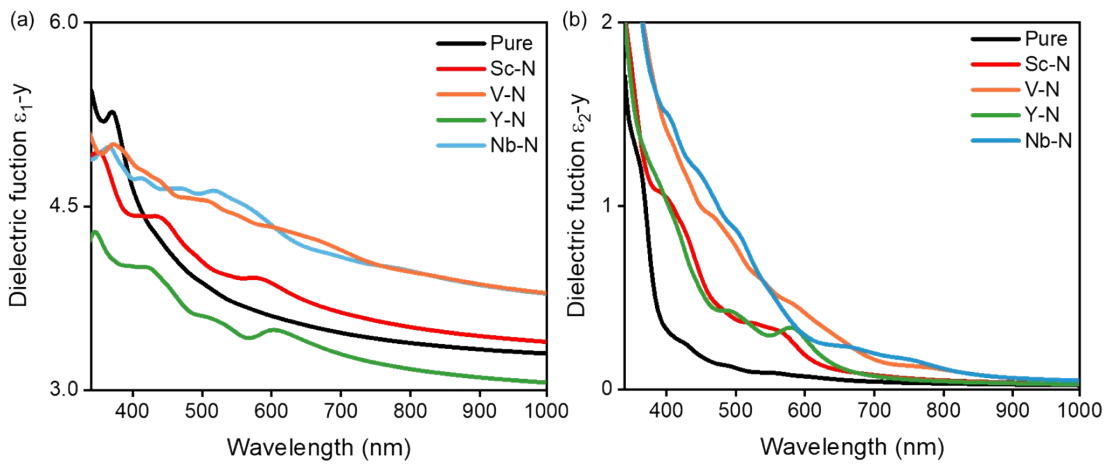


Fig S4. The (a) real and (b) imaginary parts of dielectric functions along the y direction of isoelectric co-doped BPs.