Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supporting Information

Humidity Reduction by using Hetero-layered Metal-Organic Framework Nanosheet Composites as Hygroscopic Materials

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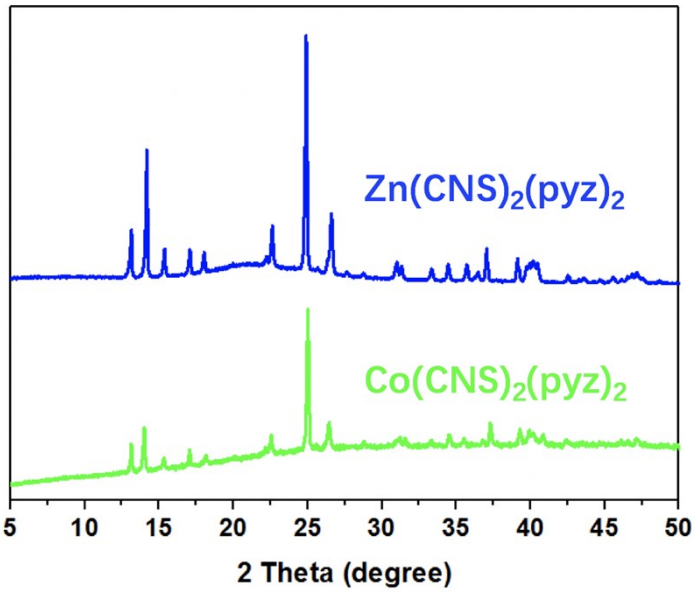

Figure S1. PXRD patterns of the bulk precursors of 2D-Zn and 2D-Co, which have suggested the identical crystal lattice.

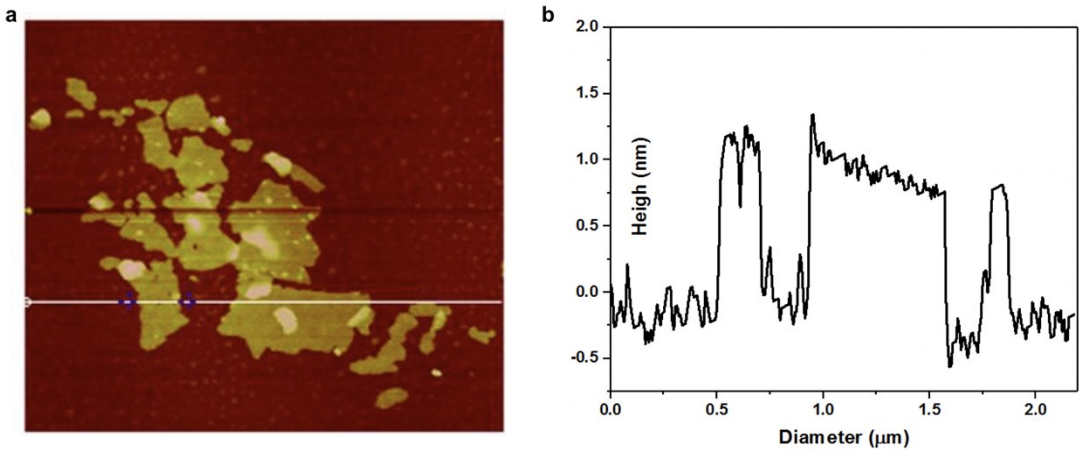

Figure S2. (a) AFM topological image and (b) height profile of 2D-Co along the white line.

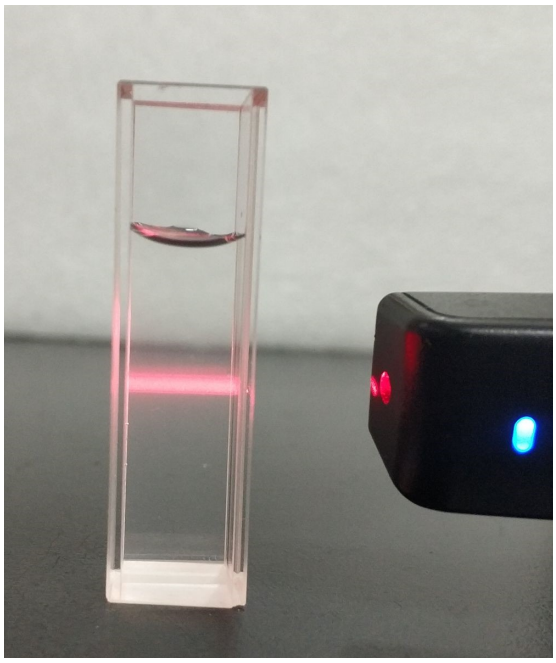

Figure S3. Tyndall effect of an ethanolic colloidal suspension of 2D-Zn, suggesting the obtain of ultrathin 2D nanosheets.

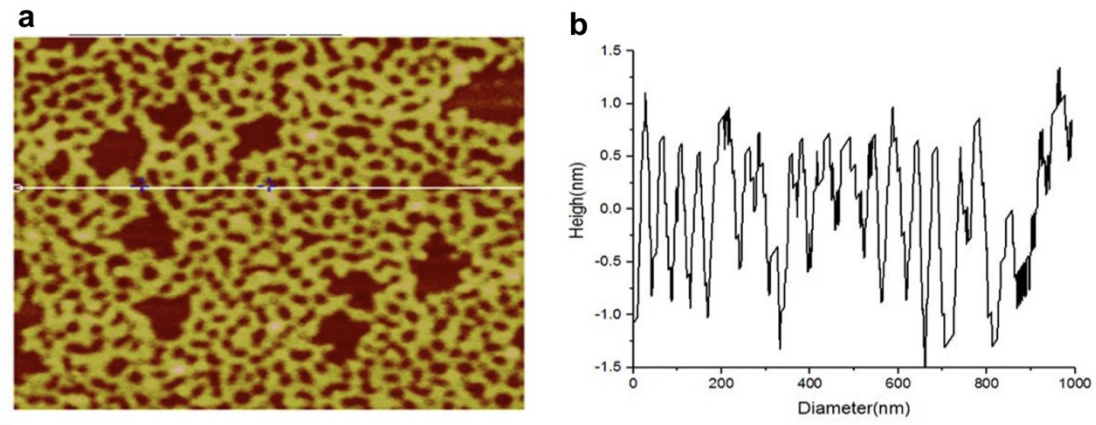

Figure S4. (a) AFM topological image and (b) height profile of 2D-Co/2D-Zn along the white line.

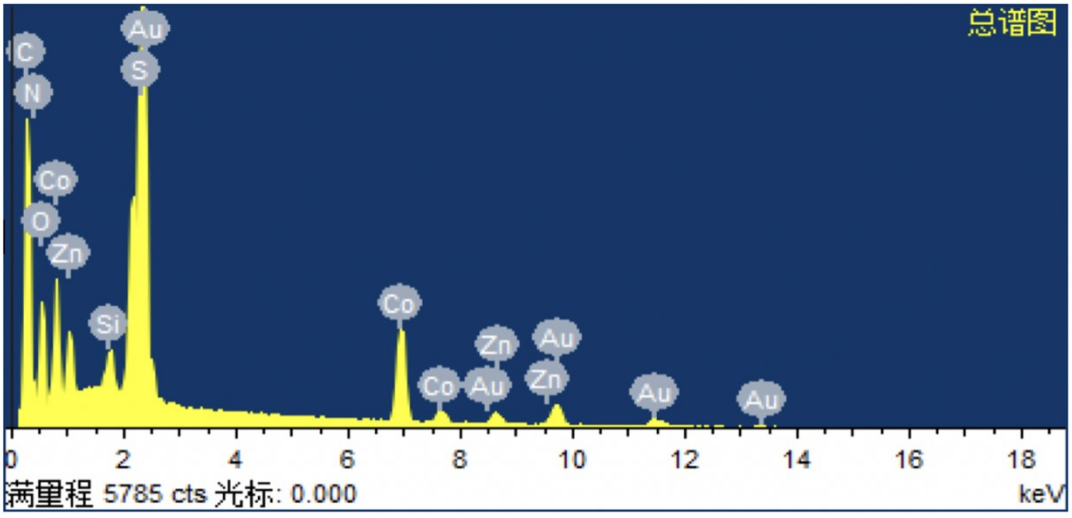

Figure S5. EDXA mapping of 2D-Co/2D-Zn sample, which suggesting the molar ratio of 3:1 for Co:Zn.

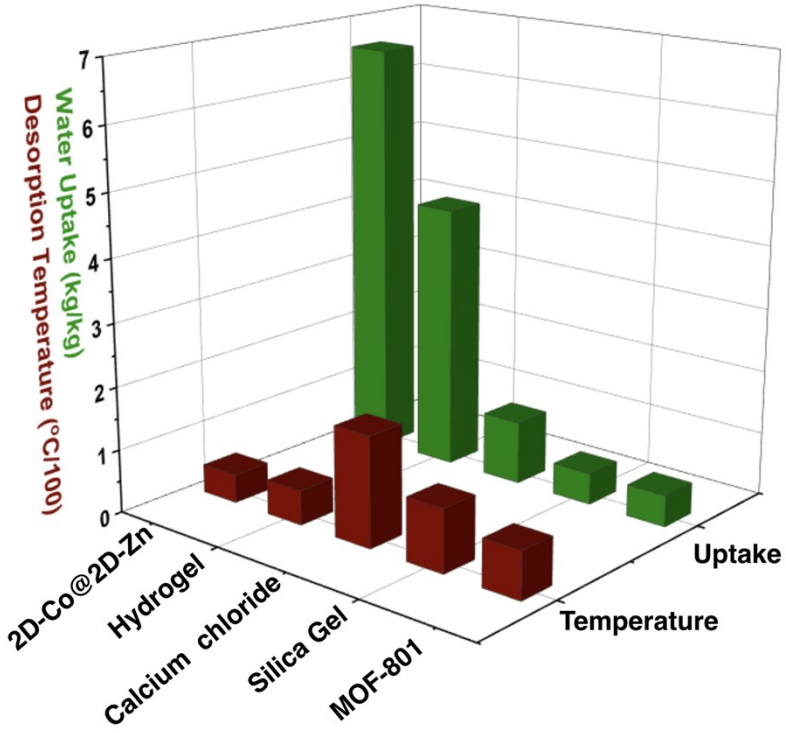

Figure S6. Comparison between the maximum water adsorption capability and desorption temperature of some of the recent-reported hygroscopic materials with the present work.

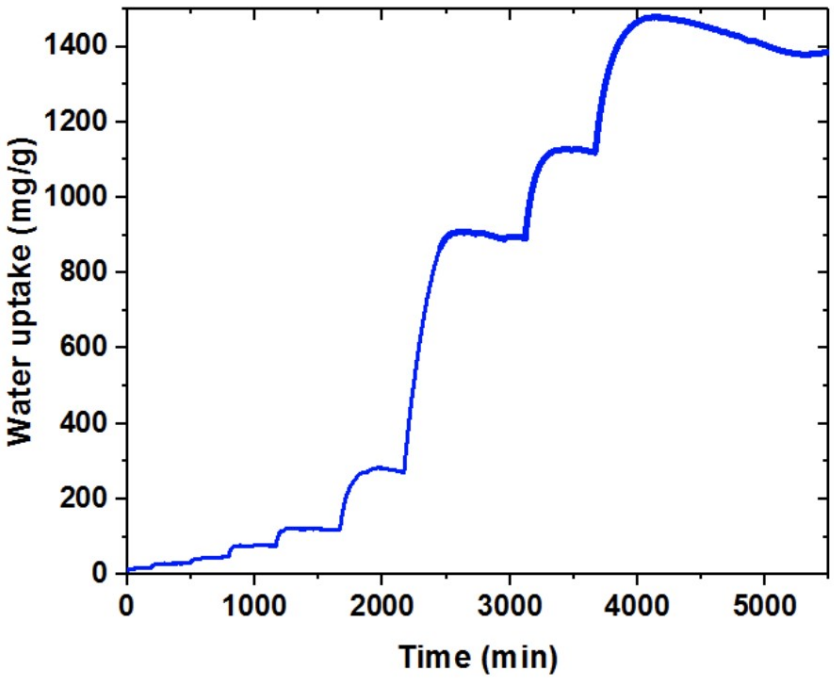

Figure S7. Time-dependent low-pressure water sorption isotherms for 2D-Co/2D-Zn.

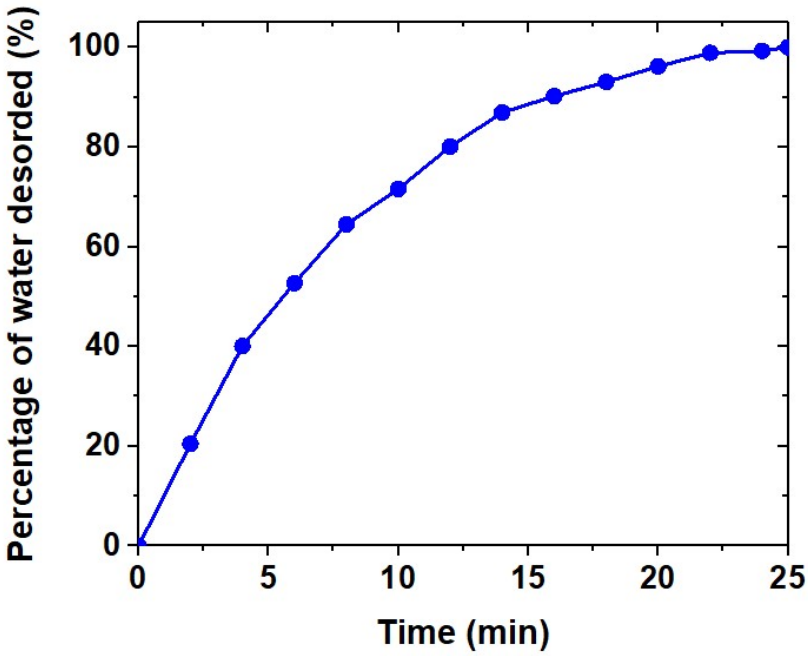

Figure S8. Desorption profiles for the water saturated samples after 720 min absorption upon heating under 40 ºC.

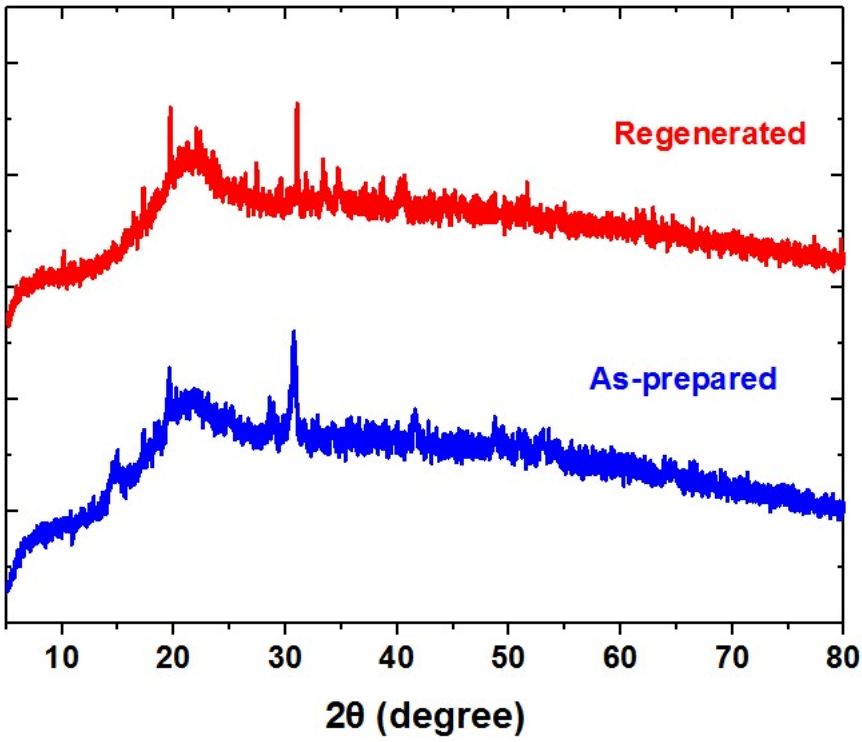

Figure S9. Comparison between the PXRD patterns of 2D-Co/2D-Zn before water adsorption and after water release. Which are almost identical, suggesting the desired stability of 2D-Co/2D-Zn. The slight deviation can be attributed to the caking of nanosheets after water release.

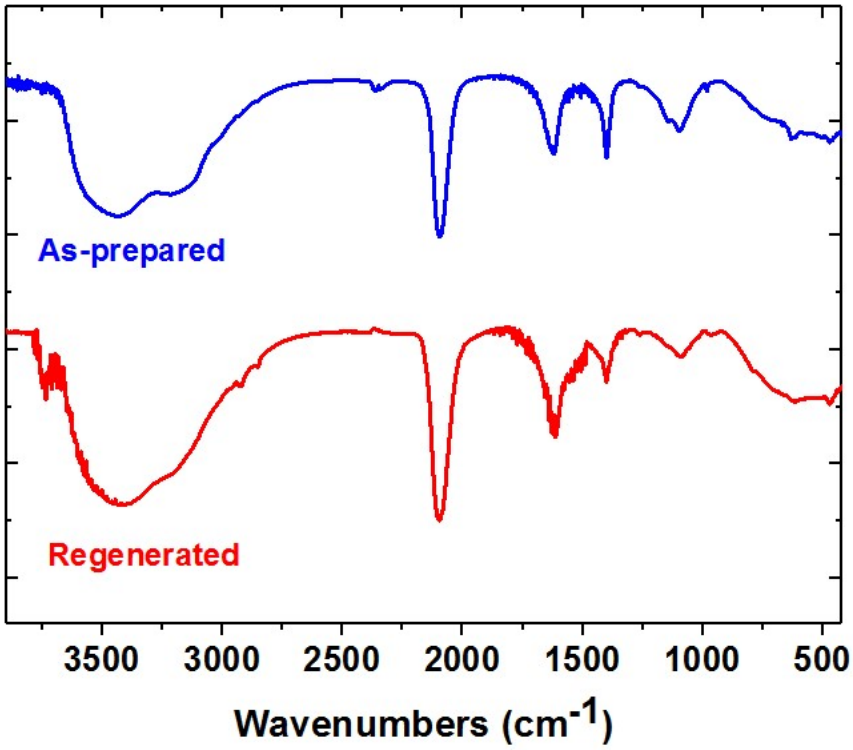

Figure S10. Comparison between the IR spectra of 2D-Co/2D-Zn before water adsorption and after water release, which are almost identical, suggesting again the desired stability of 2D-Co/2D-Zn.

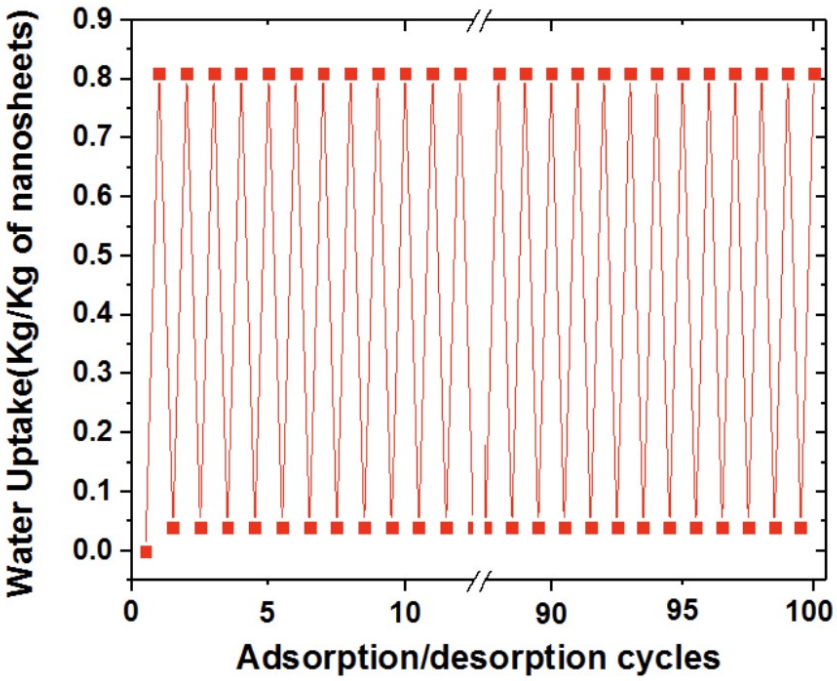

Figure S11. The 30 min absorption per 6 min desorption cycles repeated on 2D-Co/2D-Zn, which showed excellent stability for more than 100 absorption/desorption cycles.