

Figure S1. XRD patterns of the T-Z/S(2.5) and Z/S(2.5).

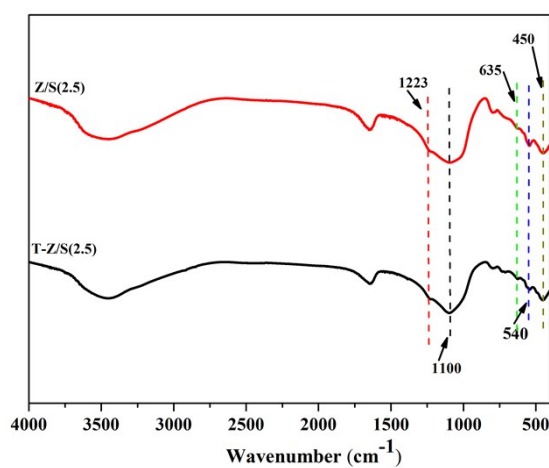


Figure S2. FT-IR spectra of T-Z/S(2.5) and Z/S(2.5).

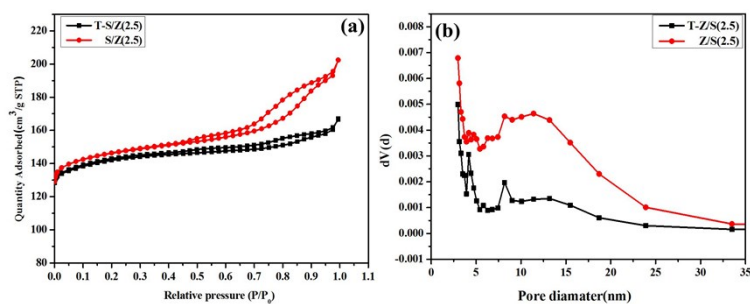


Figure S3. N₂ adsorption–desorption isotherms (a) and BJH pore size distribution curves (b) of T-Z/S(2.5) and Z/S(2.5).

Table S1. Textural properties of T-Z/S(2.5) and Z/S(2.5).

Samples	S_{BET} ($\text{m}^2 \text{g}^{-1}$)	S_{exter} ($\text{m}^2 \text{g}^{-1}$)	$V_{\text{total}}^{\text{a}}$ ($\text{cm}^3 \text{g}^{-1}$)	$V_{\text{micro}}^{\text{b}}$ ($\text{cm}^3 \text{g}^{-1}$)	V_{meso} ($\text{cm}^3 \text{g}^{-1}$)
T-Z/S (2.5)	571	19.8	0.259	0.214	0.045
Z/S (2.5)	583	49.5	0.314	0.206	0.108

^aVolume adsorbed at $p/p_0 = 0.99$.

^bDetermined by the t-Plot method.

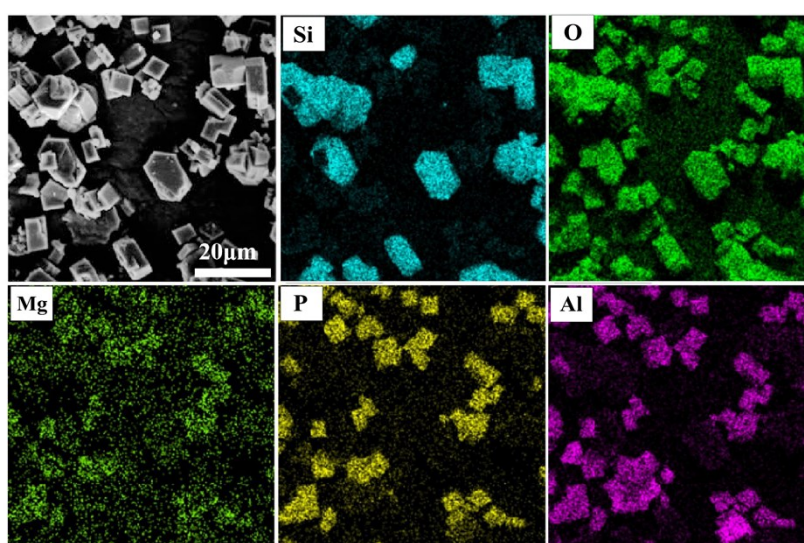


Figure S4. SEM image of Z/S(5), and corresponding EDX elemental mapping (Si, O, P, Al, and Mg).

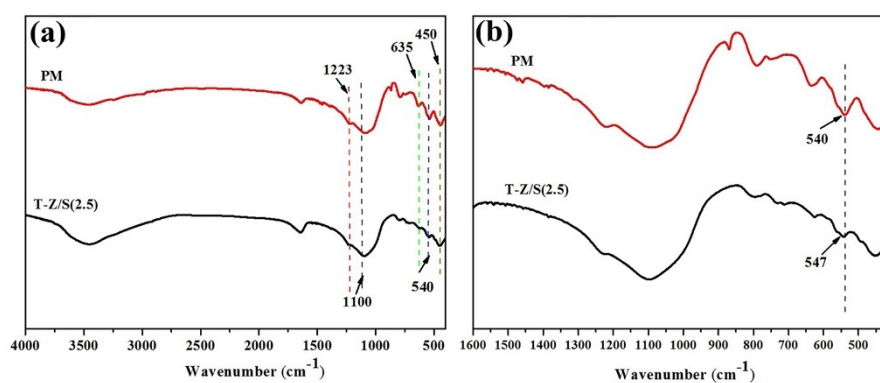


Figure S5. (a) FT-IR spectra of PM and T-Z/S(2.5). (b) zoom view between 400 and 1600 cm^{-1} .

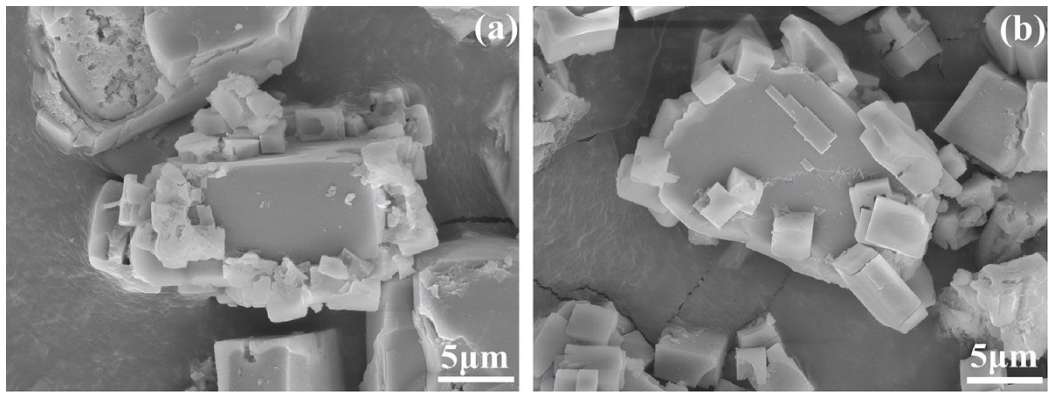


Figure S6. SEM images of Z/S(2.5).