Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Understanding the Role of Solvents in Bottom-Up Synthesis of Multi-Element Hydroxides

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Table S1 Solubility product constants

Formula	K_{sp}
$Mg(OH)_2$	5.61e-12
$Al(OH)_3$	1.3e-33
$Fe(OH)_3$	2.79e-39
$Zn(OH)_2$	3e-17

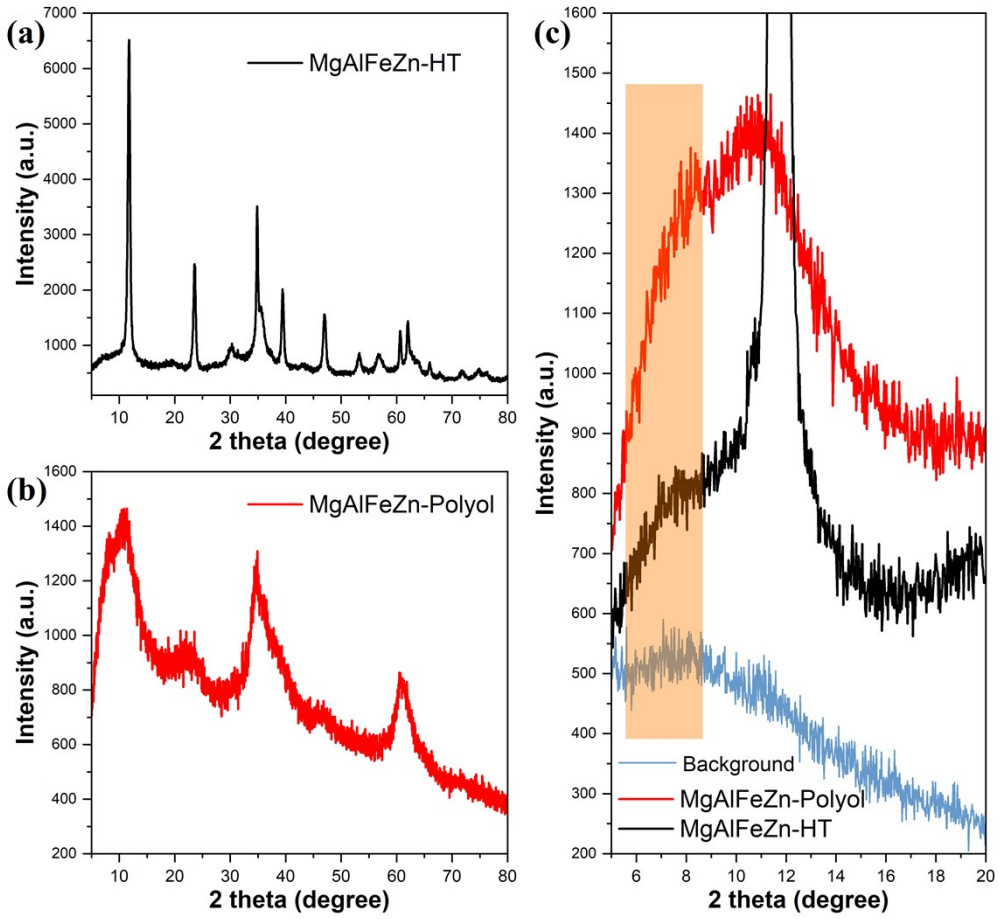

Fig. S1 XRD patterns of the (a) hydrothermal- and (b) polyol-derived MgAlFeZn hydroxides. (c) Expanded view of the MgAlFeZn hydroxides and the blank sample holder.

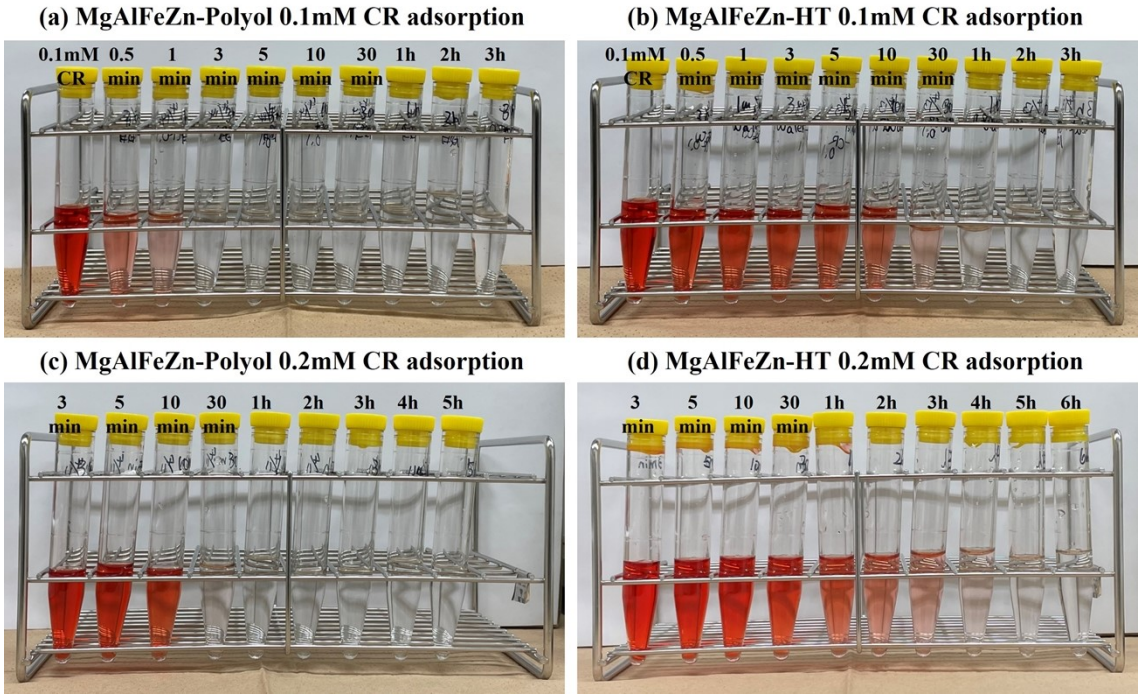

Fig. S2 Photographs of the CR aqueous solutions in adsorption kinetics study.

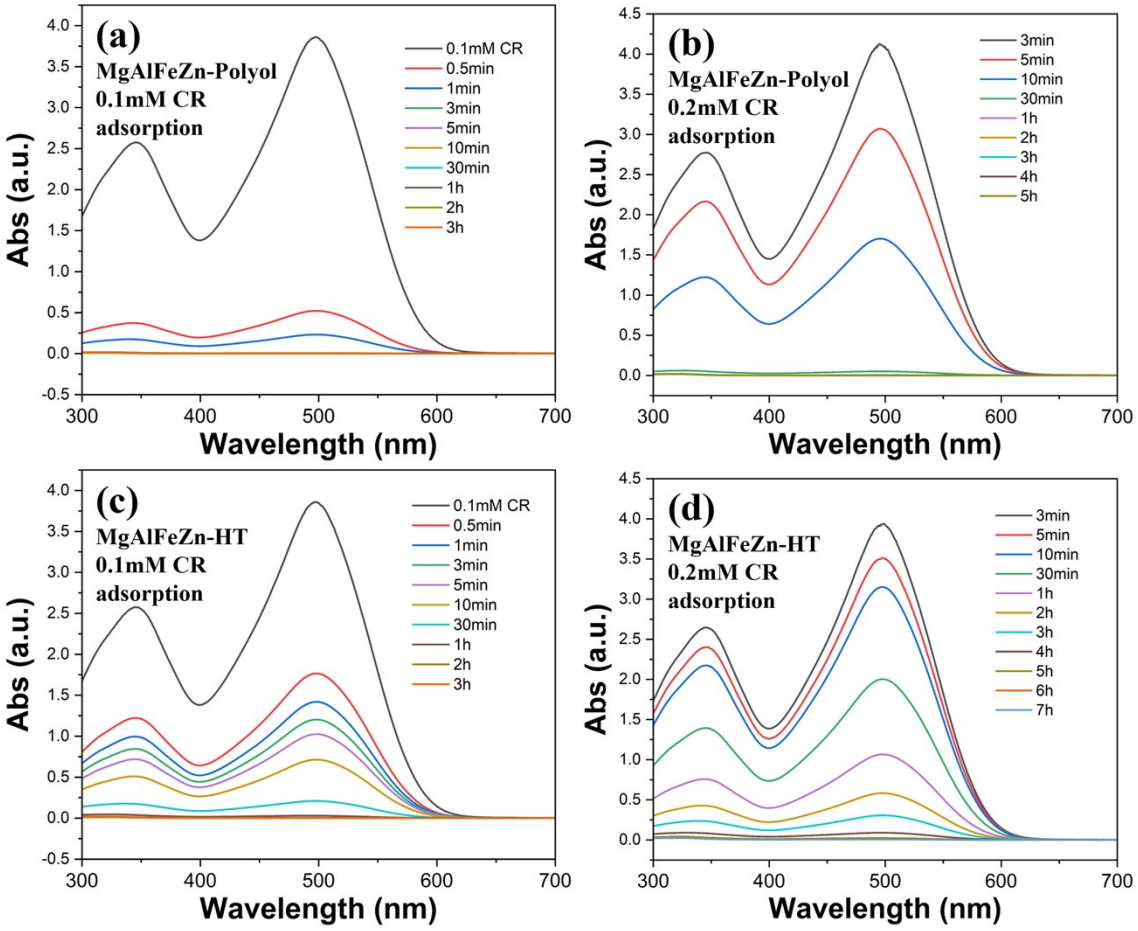

Fig. S3 UV-vis spectra of the CR aqueous solution in adsorption kinetics study.

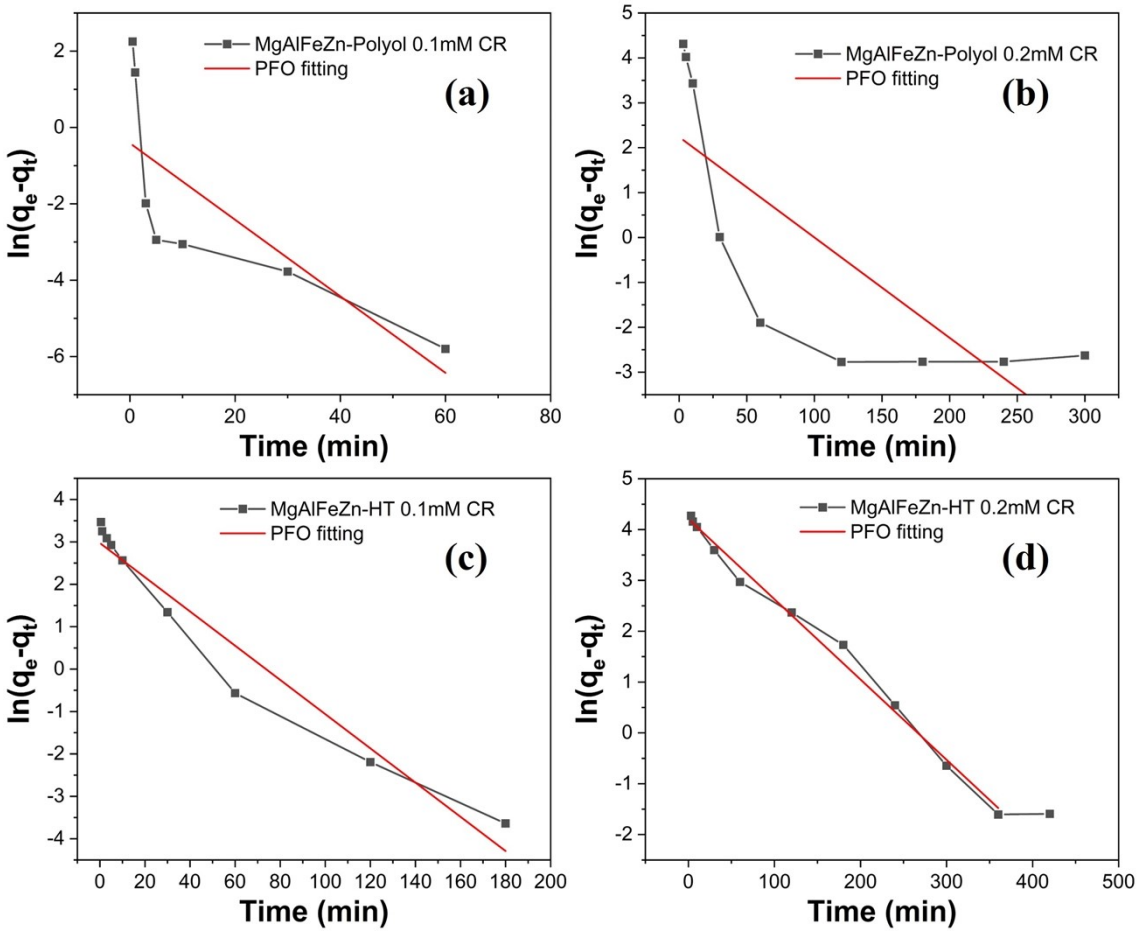

Fig. S4 Pseudo-first-order (PFO) model fitted curves for CR adsorption onto the MgAlFeZn-Polyol and MgAlFeZn-HT hydroxides.

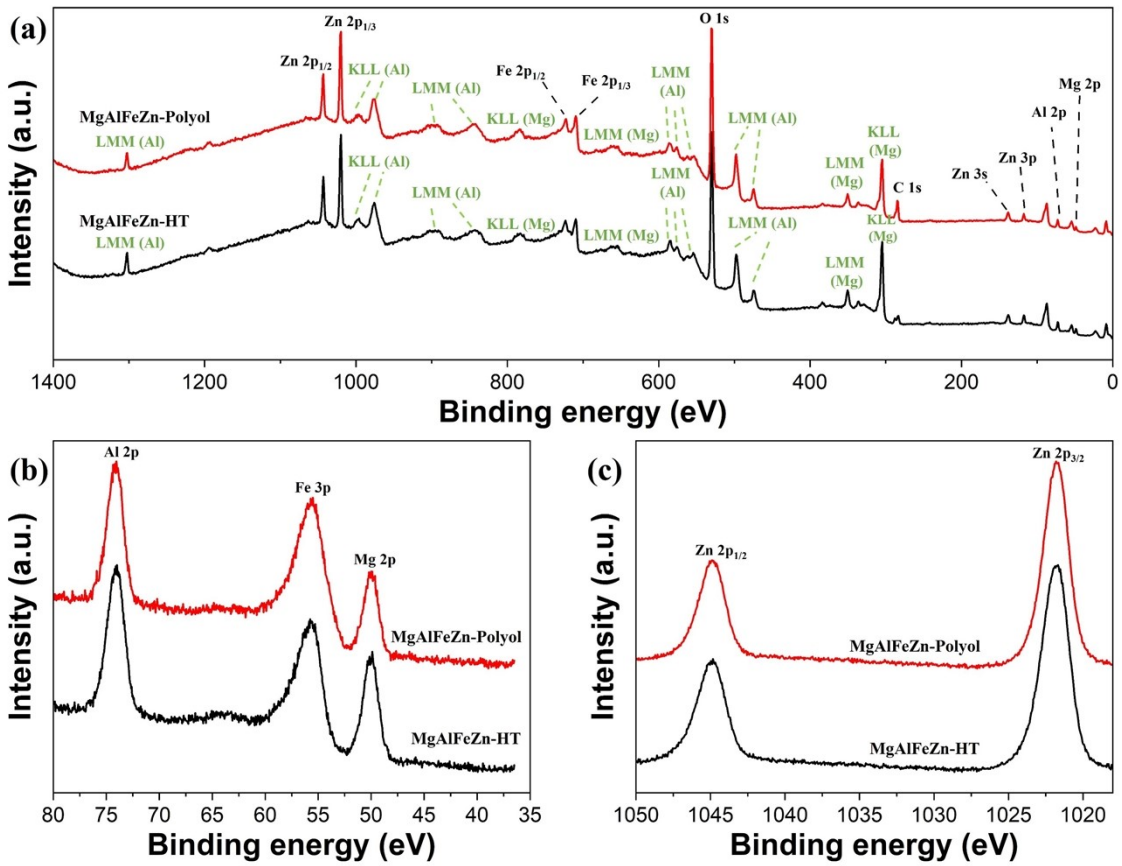

Fig. S5 (a) XPS survey spectra of the MgAlFeZn-Polyol and MgAlFeZn-HT. The green labels indicate the Auger peaks of the corresponding elements. (b) Al 2p, Fe 3p and Mg 2p spectra of the MgAlFeZn-Polyol and MgAlFeZn-HT. (c) Zn 2p spectra of the MgAlFeZn-Polyol and MgAlFeZn-HT

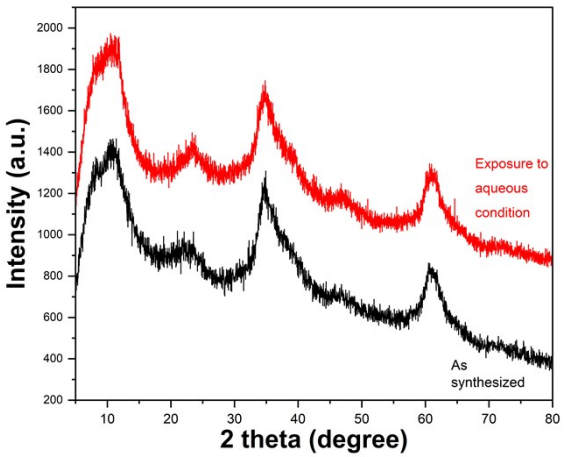

Fig. S6. XRD patterns of MgAlFeZn-Polyol as synthesized powders and after exposure to aqueous conditions.