Electronic Supplementary Information

Structural Adjustment During Intercalation of Macrocyclic Crown Ether into LDH via Swelling/Restoration Reaction: Staging Formation and Mechanism Insights

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**Fig. S1** XRD patterns of the precursor MgAl–NO₃–LDH (a) and the wet colloidal aggregate of NO₃–LDH in formamide (b, b'). *d*-value in nanometers.
Fig. S2 FT-IR spectra of the restored samples (unwashed and water-washed 4 times) of T0.125L (a, a’), T0.25L (b, b’), T0.5L (c, c’), T2L (d, d’), and T2L-less NaOH (e, e’), respectively.
Fig. S3 FT-IR spectra of the precursors HCl-type TECA (a) and MgAl–NO$_3$–LDH (b), respectively.

Fig. S4 TG-DTA curves of the precursors MgAl–NO$_3$–LDH (a) and TECA (b), and composites T2L (c), T0.5L (d) and T0.25L (e), respectively.
**Scheme S1.** Two configurations of the staging structure.

**Scheme S2.** The formation process of the composite T2L+Na$_2$CO$_3$.

**Scheme S3.** Synthetic route of TECA.