

Supporting information

HCl Removal Using Calcined Ca-Mg-Al Layered Double Hydroxide in the Presence of CO₂ at Medium-high Temperature

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Table S1. BET Surface Area and Pore-size Distribution for CaMgAl-LDOs at different conditions

sample	Surface area (m ² g ⁻¹)	Pore Volume (cm ³ g ⁻¹)	Pore Diameter (nm)
Fresh sample	29.824	0.086	11.634
Calcined at 550 °C	31.654	0.093	18.972
Calcined at 600 °C	34.757	0.108	23.037
Calcined at 650 °C	31.293	0.089	15.682
Calcined at 700 °C	28.761	0.078	9.664
Recovered CaMgAl-LDOs at 400 °C	23.964	0.082	10.792
Recovered CaMgAl-LDOs at 500 °C	20.366	0.086	11.328
Recovered CaMgAl-LDOs at 600 °C	15.257	0.067	9.655
Recovered CaMgAl-LDOs at 700 °C	10.091	0.017	3.214
Recovered CaMgAl-LDOs at 800 °C	3.325	0.008	0.861

The BET Surface Area and pore characteristics of all the samples were performed by N₂-adsorption with the results being shown in **Table S1**. The BET Surface Area of the CaMgAl-LDOs increase from 31.654 m² g⁻¹ (550 °C) to 34.757 m² g⁻¹ (600 °C), followed by decreasing to 28.761 m² g⁻¹ (700°C), which may be associated with the sintering of CaMgAl-LDOs during the pretreatment. The BET Surface Area of the recovered CaMgAl-LDOs decrease from 23.964 m² g⁻¹ (400 °C) to only 3.325 m² g⁻¹

(800 °C), which could be associated with the sintering effect and phase transformation of CaMgAl-LDOs during the adsorption process.