

Supporting Information

Construction of perovskite oxide/modified biochar for photothermal synergistic catalytic degradation of VOCs

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1. O₂-TPD experiment

Oxygen temperature-programmed desorption (O₂-TPD) experiment was performed on a Micromeritics AutoChem 2920 chemisorption instrument equipped with a TCD to quantify the O₂ desorption. Firstly, 0.1 g catalyst was placed into a quartz reactor heating to 300 °C with a rate of 10 °C/min and kept at this temperature for 1 h under a He flow (40 mL/min). Next, the temperature was cooled to room temperature, and adsorbing gases flow (5% O₂/He, 50 mL/min) was introduced and passed through the catalyst for 30 min. Finally, the sample was continued to purge in a He flow (50 mL/min) for 30 min, and then the desorption O₂ signal was recorded between 50 °C to 600 °C with a rate of 10 °C/min.

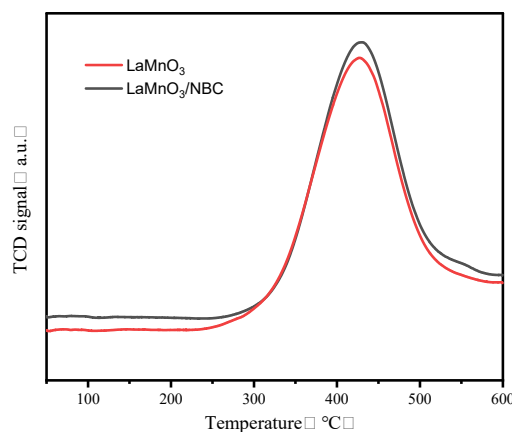


Fig. S1 O₂-TPD profiles of LaMnO₃ and LaMnO₃/NBC composite

2 *In-situ* DRIFTS characterization

The *in situ* diffuse reflectance Fourier transform infrared spectroscopy (*in situ* DRIFTS) experiments were performed on Nicolet iS20 FT-IR instrument with a MCT detector. Firstly, the pretreated sample was activated at 300°C for 30 minutes under N₂ flow. The background spectrum was collected in flowing N₂ environment at 30°C. Next, p-xylene was passed through at a rate of 30 mL/min via a water bubbler. After keeping in the dark environment for 30 minutes, air was introduced into the DRIFT cell and the sample was exposed to 300 W Xenon lamp irradiation.

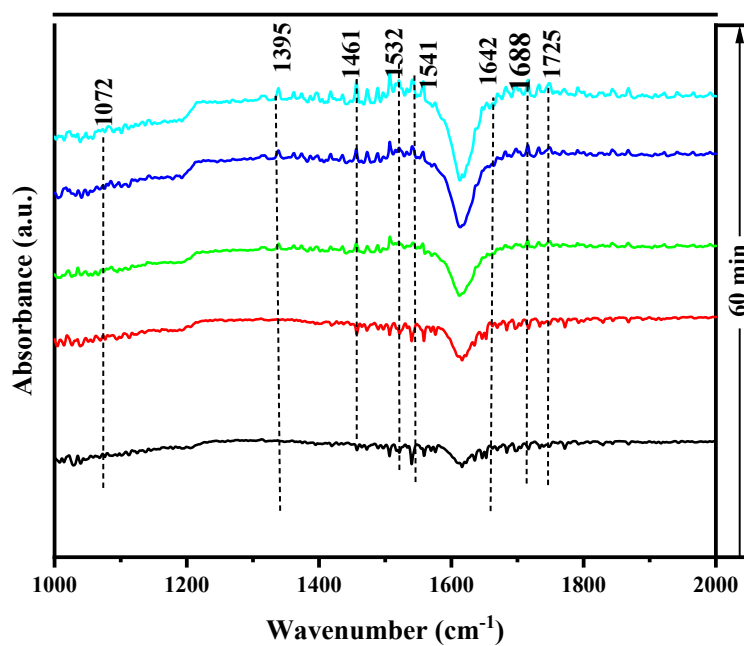


Fig. S2 *In-situ* DRIFTS study on LaMnO₃/NBC composite : photothermal catalysis of p-xylene