Supplementary information

Text S1

Preparation of UiO-66 and MgAl-LDHs

UiO-66 was prepared by the hydrothermal synthesis method, and some improvements were made based on Kandiah [1]. The specific operation steps are as follows: 150 mg of $ZrCl_4$ and 106.9 mg of H_2BDC were mixed into a beaker (100 mL), then added 50 mL DMF and 10 mL acetic acid solution, and the mixture was sonicated for 30 min. It was poured into a hydrothermal reactor (100 mL, PTFE-lined), and then the reactor was heated at 120 °C for 24 hours. After cooling, the white powder obtained was washed three times with anhydrous ethanol to remove the excess DMF inside the UiO-66, and then it was filtered. The raw sienna substance on the filter membrane was scraped off, and then it was vacuum dried at 60 ℃ for 12 hours.

A hydrothermal synthesis method was adopted to prepare MgAl-LDHs: 5.12 g of $Mg(NO_3)_2 \cdot 6H_2O$ and 3.75 g of $Al(NO_3)_3 \cdot 9H_2O$ were dispersed in 100 mL of deionized water (DW), along with the addition of 6 g of urea. The suspension was stirred at room temperature for 5 minutes, and then it was transferred to a hydrothermal reactor and treated in an oven at 110 ℃ for 24 hours. After washing the mixed substances in the polyester hydrothermal kettle with DW, the mixed system was centrifuged through a high-speed centrifuge to collect white precipitates at the bottom. The sample product (MgAl-LDHs) was vacuum-dried at 60 ℃ for 12 hours.

Fig. S1 The synthesis strategy of UL_3.

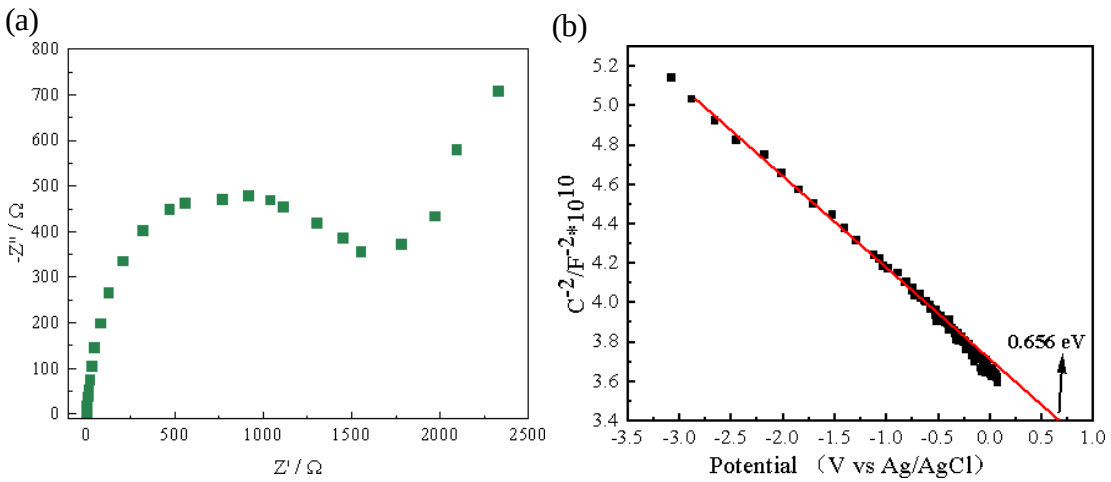

Fig. S2 Electrochemical characterization of UL_3 material (a) EIS, (b) Mott-Schottky

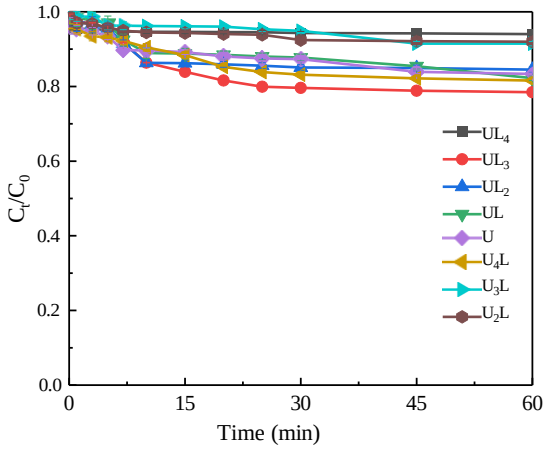

Fig.S3 Dark adsorption curves for U_xL_y series materials

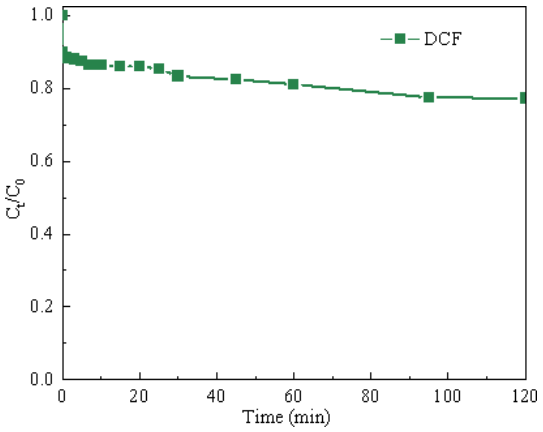

Fig.S4 Blank degradation experiment of DCF

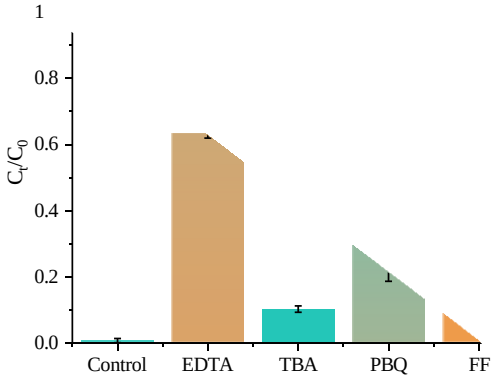

Fig. S5 Radical quenching experiments.

Reference

1. M. Kandiah, M. H. Nilsen, S. Usseglio, S. Jakobsen, U. Olsbye, M. Tilset, C. Larabi, E. A. Quadrelli, F. Bonino and K. P. Lillerud, Synthesis and Stability of Tagged UiO-66 Zr-MOFs, *Chemistry of Materials*, 2010, **22**, 6632-6640.