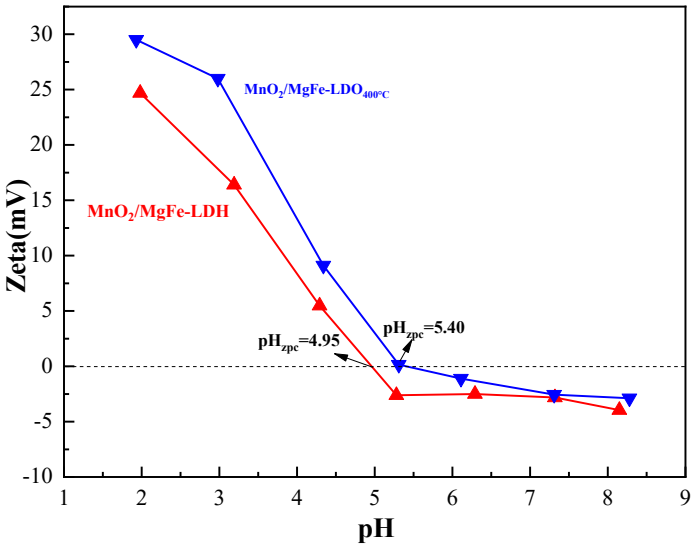

Figure 1. pH-zeta of MnO_2/MgFe-LDH and MnO_2/MgFe-$LDO_{400℃}$ composites.

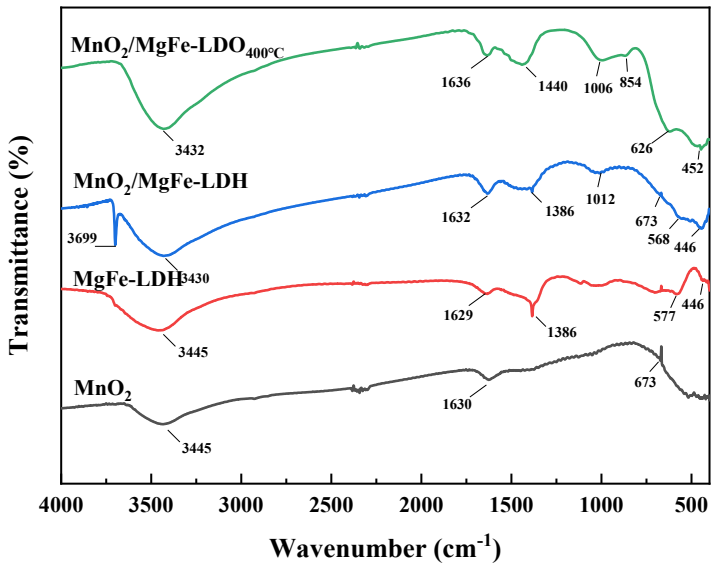

Figure 2. FT-IR diagram of MnO_2, MgFe-LDH, MnO_2/MgFe-LDH and MnO_2/ MgFe-$LDO_{400℃}$

Table 1 Analysis of specific surface area and pore size of samples

样品	S_{BET}/(m^2/g)	V_{total}/(cm^2/g)	D_{BET}/nm
MnO_2	111.385	0.114	4.096
MgFe-LDH	154.005	0.390	10.135
MnO_2/ MgFe-LDH	226.794	0.388	6.841
MnO_2/MgFe-LDH$O_{400℃}$	153.455	0.589	15.349

Material synthesis methods:

The co-precipitation approach was used to prepare MnO_2/MgFe-LDH. To prepare the mixed aqueous solution, 4.615 g of $Mg(NO_3)_2{\cdot}6H_2O$ and 2.424 g of $Fe(NO_3)_3{\cdot}9H_2O$ were dissolved in 300 mL of DI water. Under vigorous stirring, NaOH was slowly added dropwise to the mixed solution. The pH of the reaction solution was maintained at 11±0.5 by controlling the lowering speed of the NaOH solution. After 48 h of ageing at 60 ℃, the $KMnO_4$ and $MnCl_2{\cdot}4H_2O$ were carefully added, followed by 4 h of stirring at 30 ℃. After ageing for 12 h, the slurry was centrifuged and rinsed numerous times with DI water until the supernatant was neutral. The MnO_2/MgFe- LDH was then dried at 70 ℃, and crushed into a powder. Finally, a portion of the MnO_2/MgFe-LDH powder was calcined at 400℃ for 5 h in a tube furnace to produce MnO_2/MgFe-$LDO_{400℃}$.