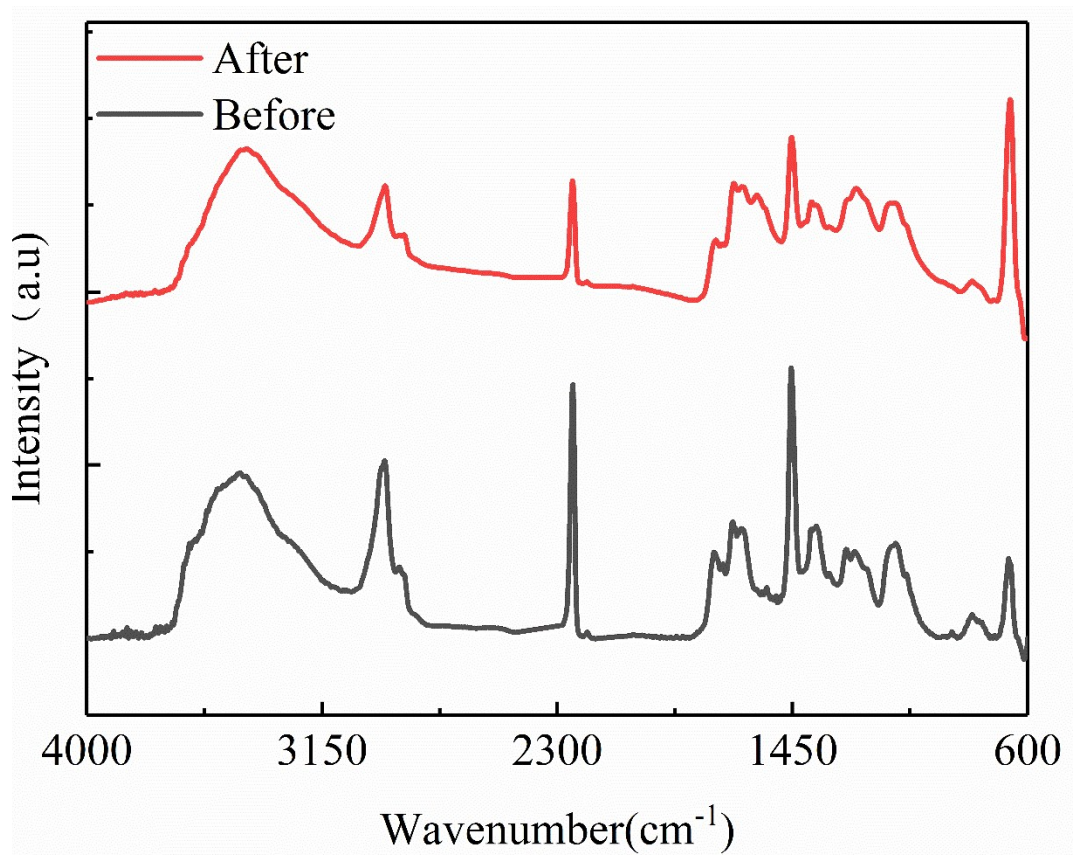


Supporting

S1: Comparison table of metal oxide and graphene synergistic catalytic materials in recent years

meterial	Graphene type	Degradation method	Radical species	lighting need	References
Fe ₂ O ₃	reduced graphene oxide	photocatalytic	hydroxyl radical	yes	(Pradhan, Padhi and Parida, 2013)
MgO	graphene oxide	photocatalytic	hydroxyl radical	yes	(Arshad <i>et al.</i> , 2017)
V ₂ O ₅	graphene	photocatalytic	oxide radicals/hydroxyl radical	yes	(Shanmugam <i>et al.</i> , 2015)
TiO	graphene oxide	photocatalytic	oxide radicals/hydroxyl radical	yes	(Zhao <i>et al.</i> , 2012)
NiO	graphene nanoplatelets	photocatalytic	hydroxyl radical	yes	(Arshad, Iqbal and Mansoor, 2017)
Mn ₃ O ₄	graphene oxide	FENTON'S REAGENT	hydroxyl radical	no	(Li <i>et al.</i> , 2015)
Co₃O₄	graphene oxide	FENTON'S REAGENT	Sulfate radical	no	(Shi <i>et al.</i>, 2012)



S 1: The result of spectroscopic characterization with membrane before and after degradation

reference

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