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Supplementary information to

Modulating Chelation with pH Sensitivity for Controlled Structural Defects and Enhanced Electrochemical and Photocatalytic activities of LDH films

Muhammad Ali Khan, Ananda Repycha Safira, Mosab Kaseem*
Corrosion and Electrochemistry Laboratory, Department of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul 05006, Republic of Korea

*Corresponding author Email: mosabkaseem@sejong.ac.kr (M. Kaseem)

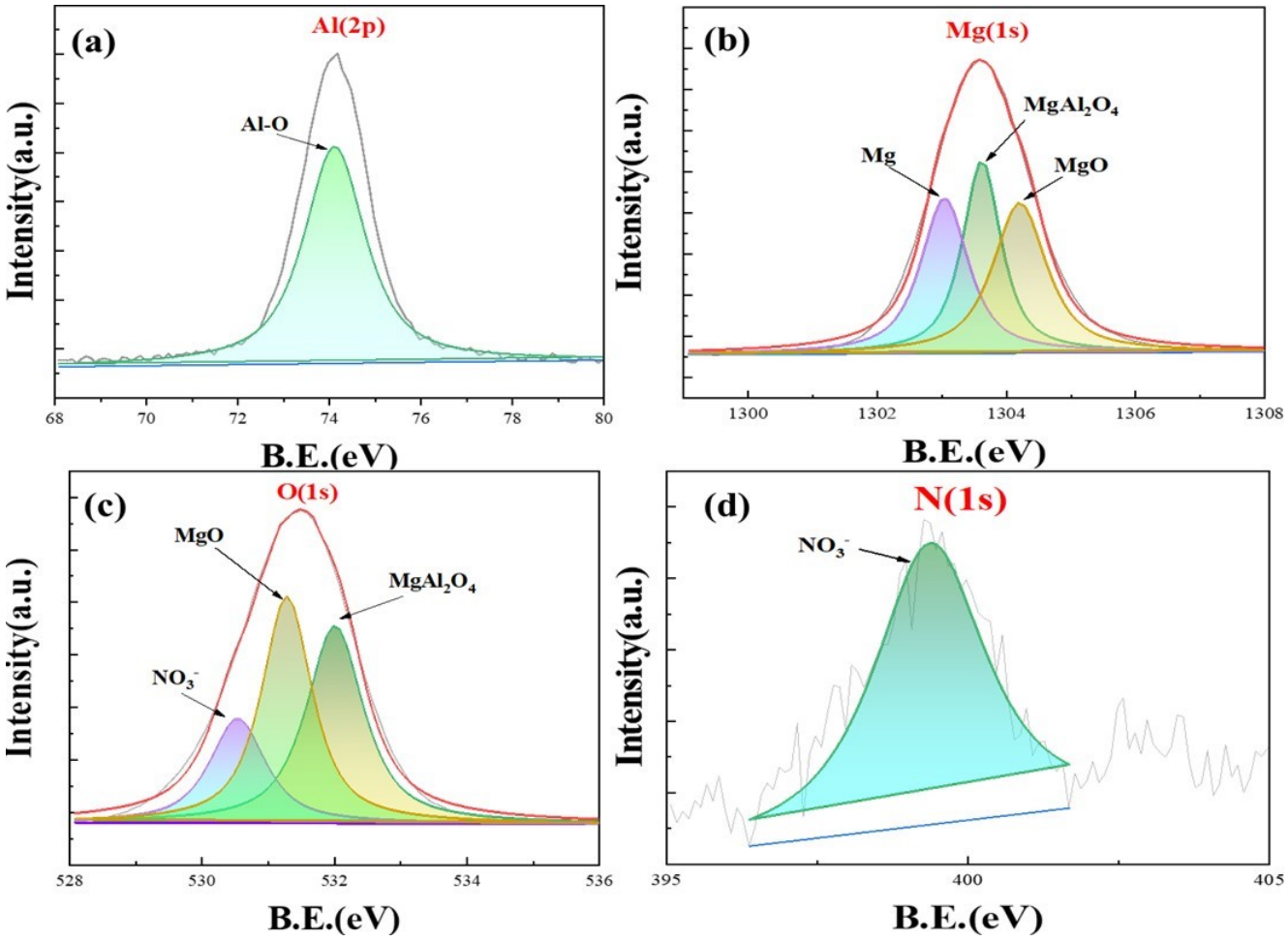


Fig.S1.High-resolution XPS spectra (a). PEO film for Al(2p), (b), LDH film for Mg(1s), O(1s) and N(1s).

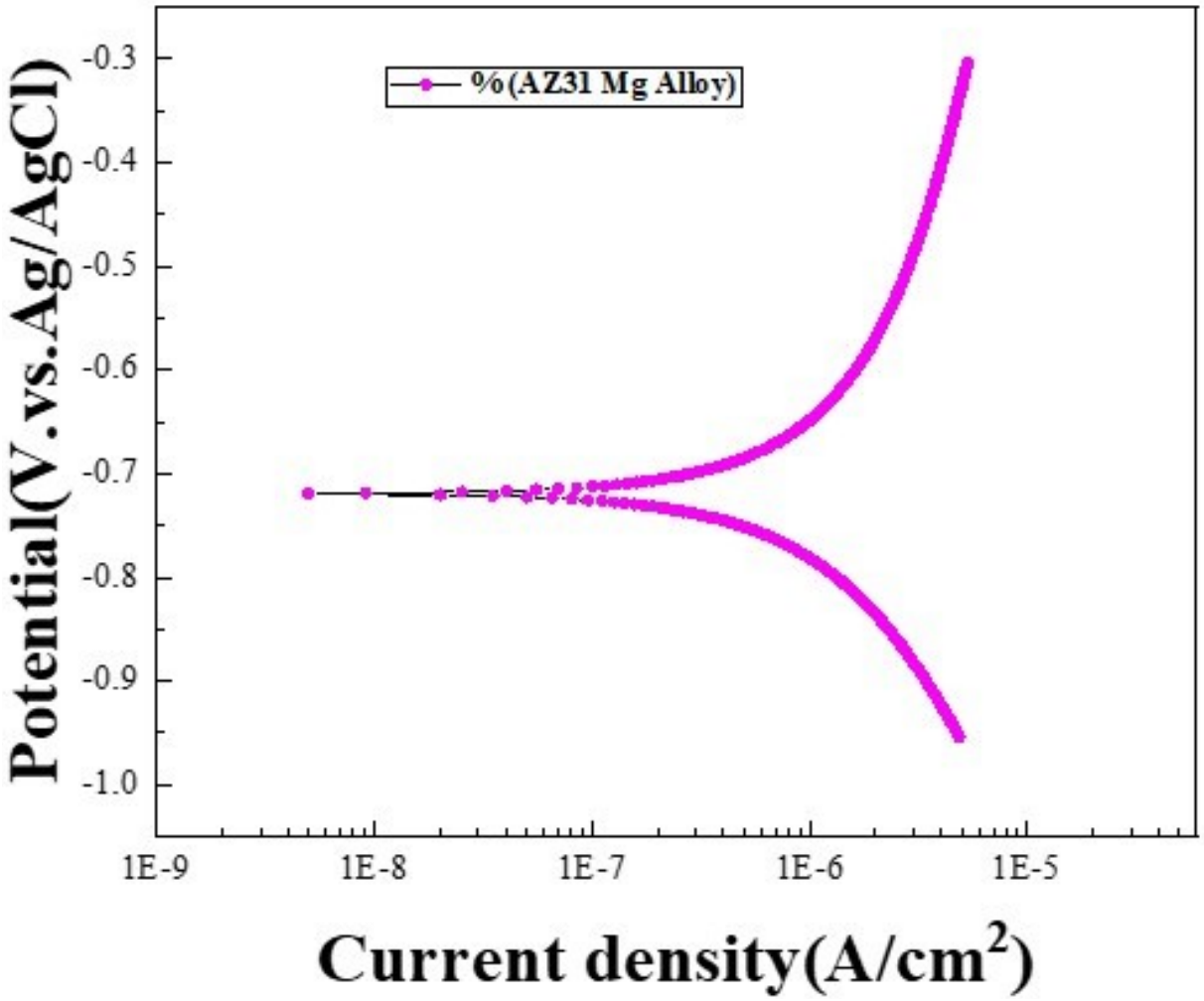


Fig.S2. The potentiodynamic polarization curve for AZ31 alloy after immersion for 5 hours in 3.5% NaCl Solution. The value of I_{corr} is 1.18×10^{-6}A/cm^2 and the value of E_{corr} is around -0.7 V/decade.

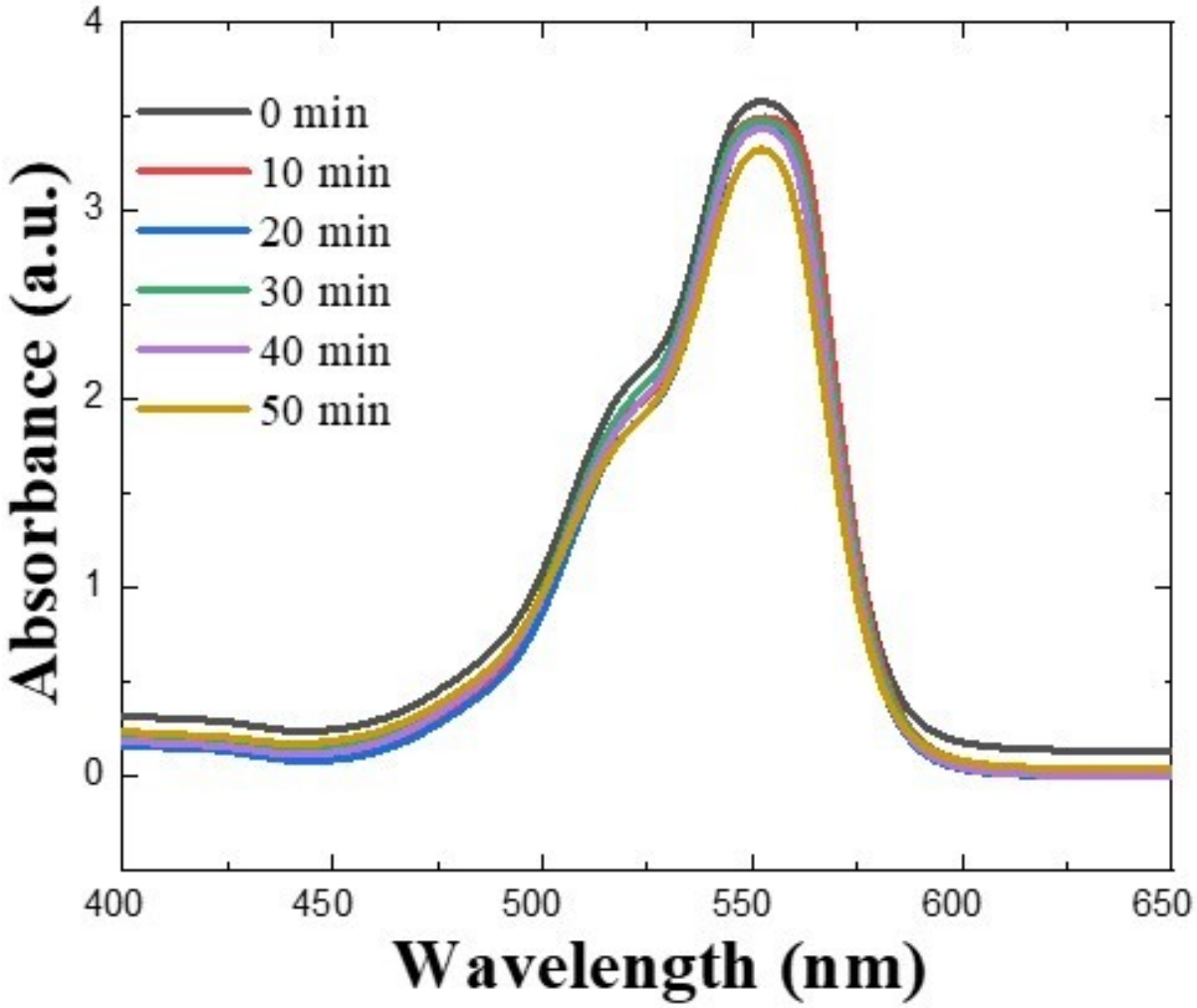


Fig.S3. UV-VIS Absorbance spectra of Rhodamine B dye without catalyst under visible irradiation such that after 50 minutes the degradation is around 5%.

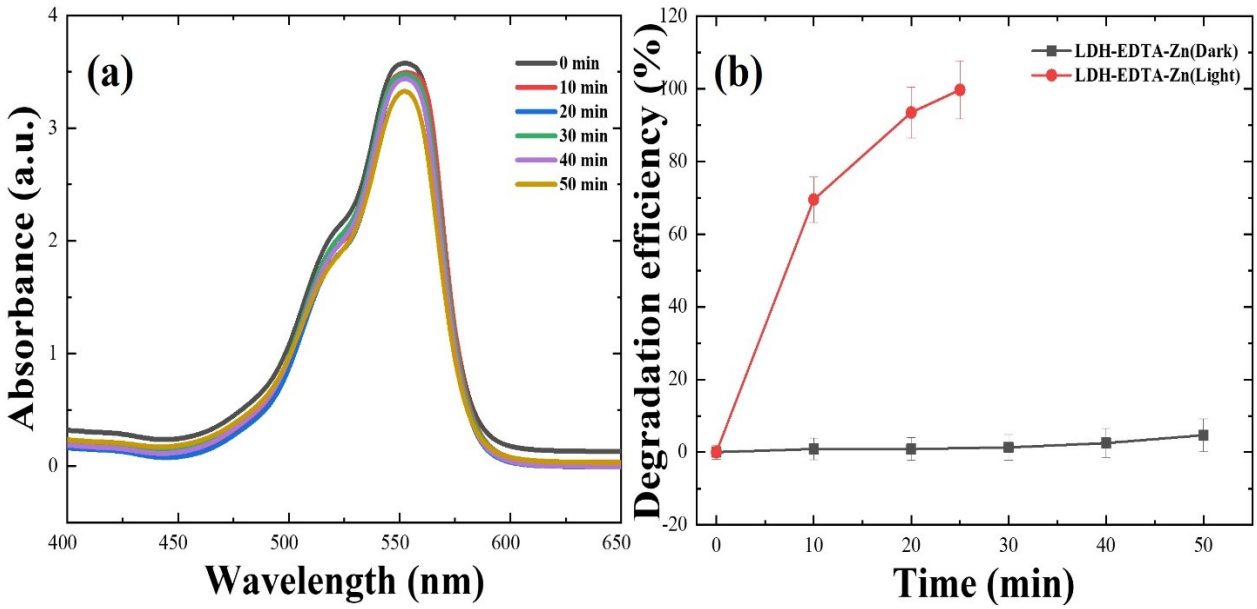


Fig.S4. (a). UV-VIS absorbance spectra of Rhodamine B dye for LDH-EDTA-Zn catalyst under dark conditions. (b). The Photocatalytic degradation of Rhodamine b for LDH-EDTA-Zn sample under light and dark conditions such that it degraded 99.7% within 25 minutes while under dark conditions it degraded only 4 %.

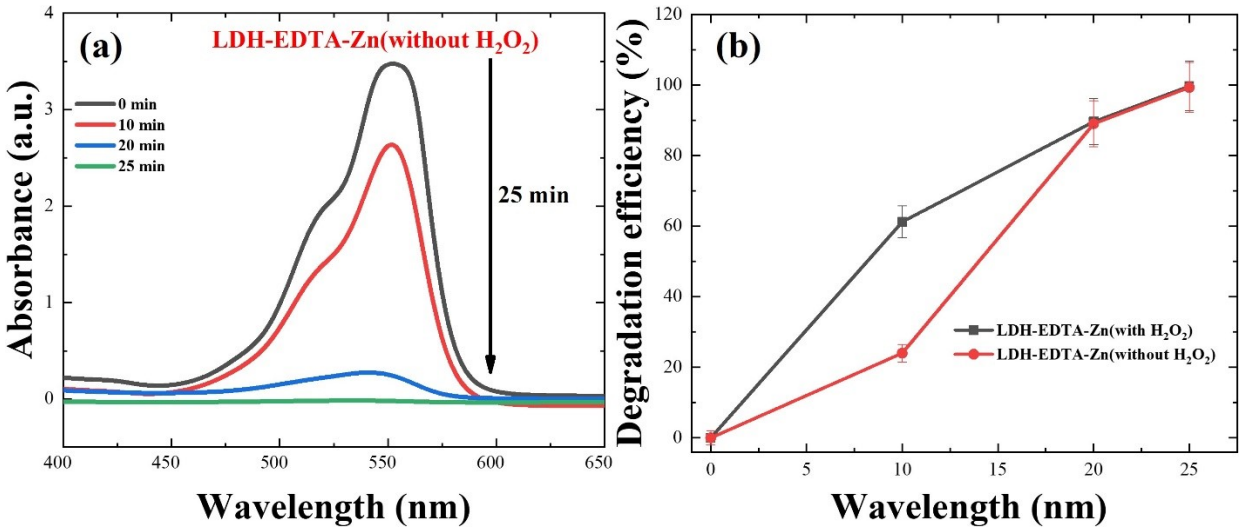


Fig.S5.(a). UV-VIS absorbance spectra of Rhodamine B for LDH-EDTA-Zn catalyst in the absence of H_2O_2. (b). The photocatalytic degradation efficiencies of LDH-EDTA-Zn with and without the addition of H_2O_2.

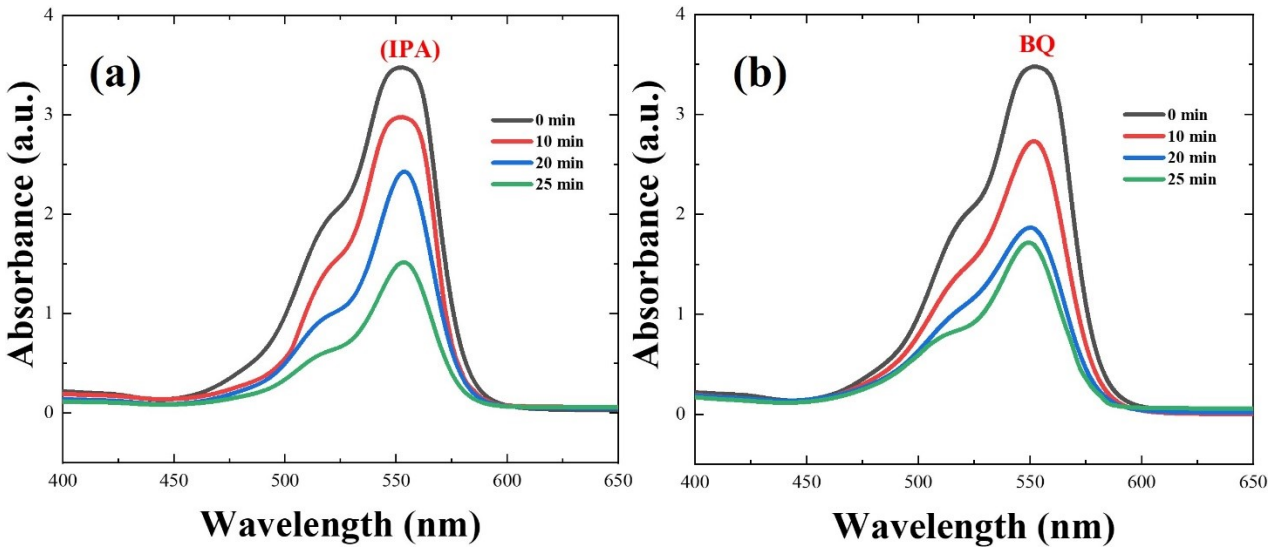


Fig.S6.(a,b). UV-VIS absorbance spectra of Rhodamine B For LDH-EDTA-Zn by adding scavengers IPA and BQ for trapping of active radicals species respectively.

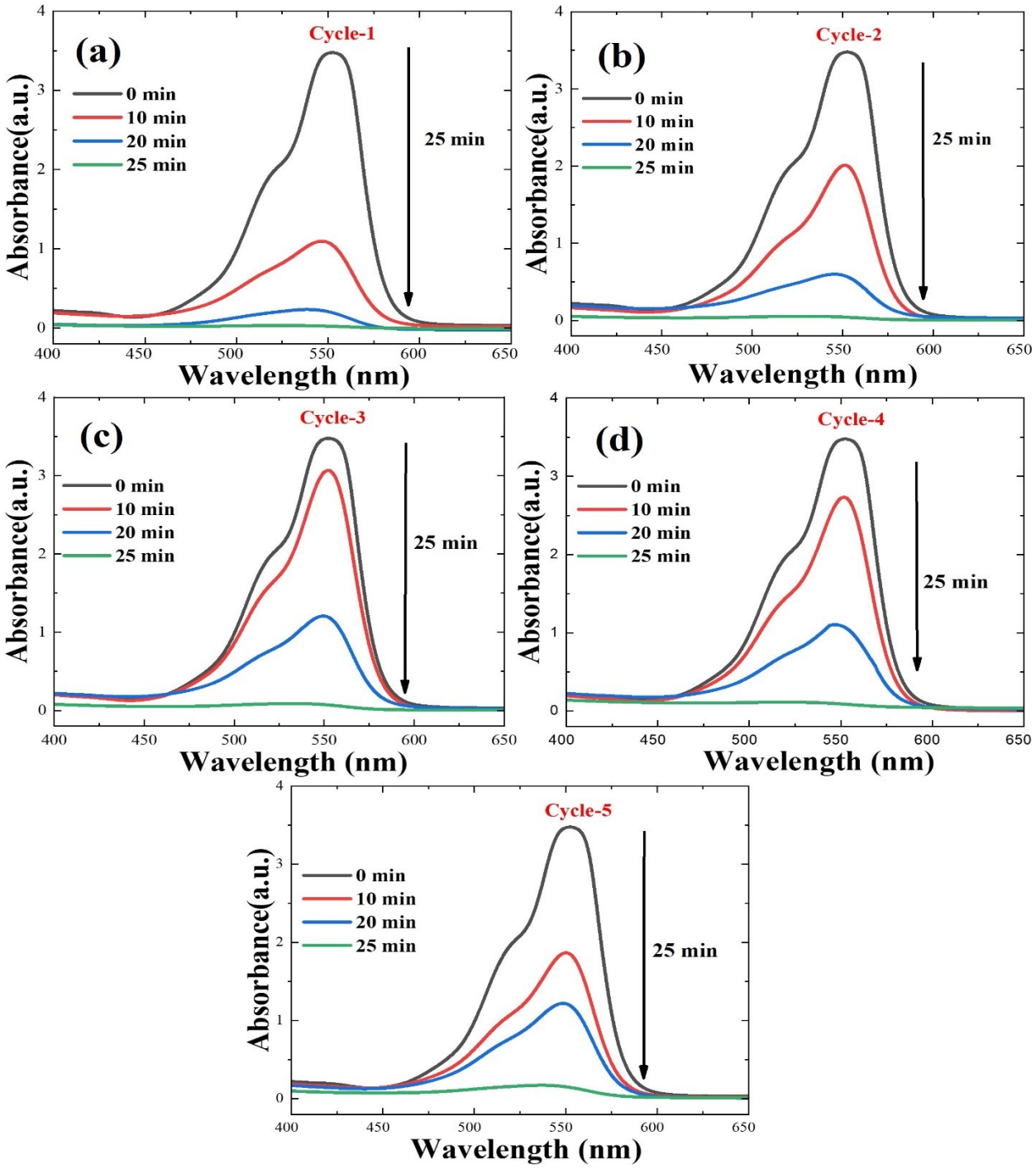
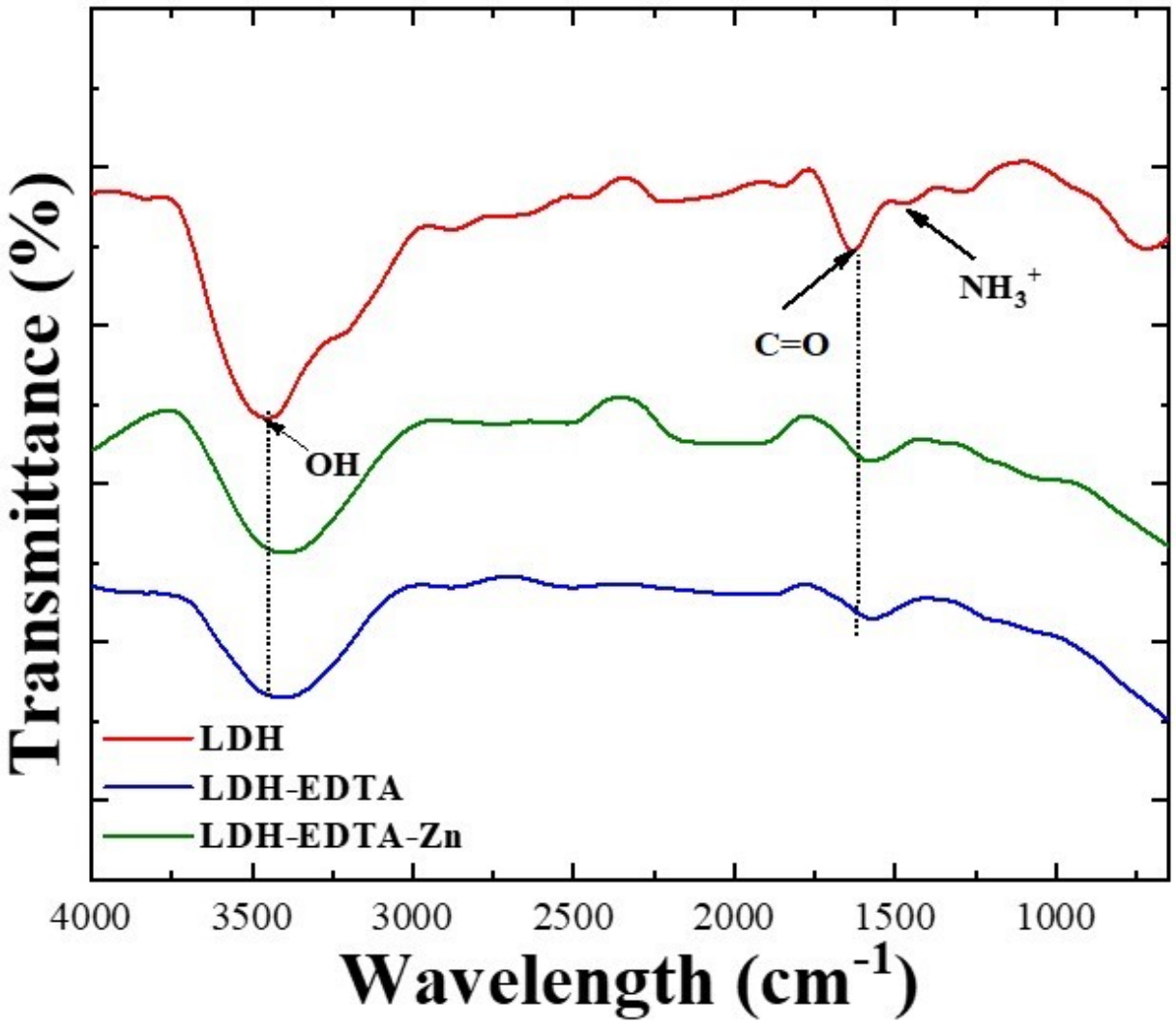


Fig.S7.(a-e). UV-VIS absorbance spectra representing the photocatalytic activity of LDH-EDTA-Zn for degradation of RhB dye up to five cycles, respectively.



S8. The FTIR spectra for LDH, LDH, EDTA, and LDH-EDTA-Zn after photocatalysis with the wavelength range of 4000-650 cm^{-1}.