Supporting Information of Preparation of PDMS modified epoxy composite coatings by Mn/Cl co-doping of g-C_3N_4 and their enhanced photocatalytic activity and Aging Resistance

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Characterization

The microstructures of CN and x-CN/WEP films were observed using scanning electron microscopy (SEM, Fei Verios 460, USA) and transmission electron microscopy (TEM). The chemical states and crystal structures of the catalysts were characterised by Fourier transform infrared spectroscopy (FT-IR, Thermal Nicolet 6700, US) and X-ray diffraction (XRD, Smart Lab 9 kW, X-Pert-Prompt, Cu Kα radiation). The high-resolution Raman spectrometer (Renishaw inVia) was employed. The chemical composition was characterised by X-ray photoelectron spectroscopy (XPS) and electron spectroscopy (EDS) using an Al Kα radiation source. The optical properties of the composites were characterised by ultraviolet-visible absorption spectroscopy (UV-2600, Shimadzu Instruments Co., Ltd.). The specific surface area (Brunauer-Emmett-Teller, BET) was determined using an automated specific surface area and porosity analyser. Photoluminescence spectra (PL) were obtained using a fluorescence spectrometer. Electrochemical measurements, including Mott-Schottky, transient photocurrent, and electrochemical impedance spectroscopy, were conducted using an electrochemical workstation (CHI760E). A servo material multifunctional high- and low-temperature universal testing machine (AI-7000-NGD, Gotwell) was employed to conduct the tensile strength test of the films at a rate of 10 mm/min.

Thermogravimetric analysis of the nanocomposites was conducted on a simultaneous thermal analyzer (DSC1, METTLER TOLEDO, Zurich, Switzerland) with a ramp rate of 10 ℃/min at temperatures ranging from 50 to 750°C.

TableS1 Comparison of the photocatalytic activity of g-C_3N_4-based catalysts for RhB degradation.

Sample	**Tensile strength (MPa)**	**Strain (%)**	**Young's modulus(MPa)**
Neat Epoxy	6.702±0.731	54.704±11.431	107.562±9.635
Epoxy-PDMS	12.945±0.637	35.848±2.687	39.825±6.816
Epoxy-PDMS-CN	14.192±0.699	23.932±6.056	33.958±8.46415

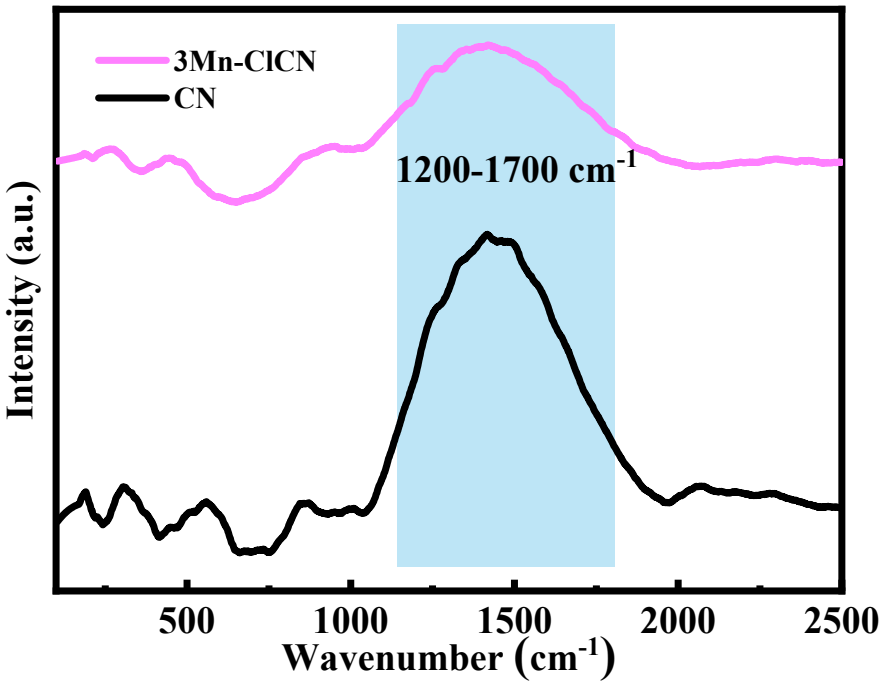

Figure S1 Raman spectra of CN and 3Mn-ClCN.

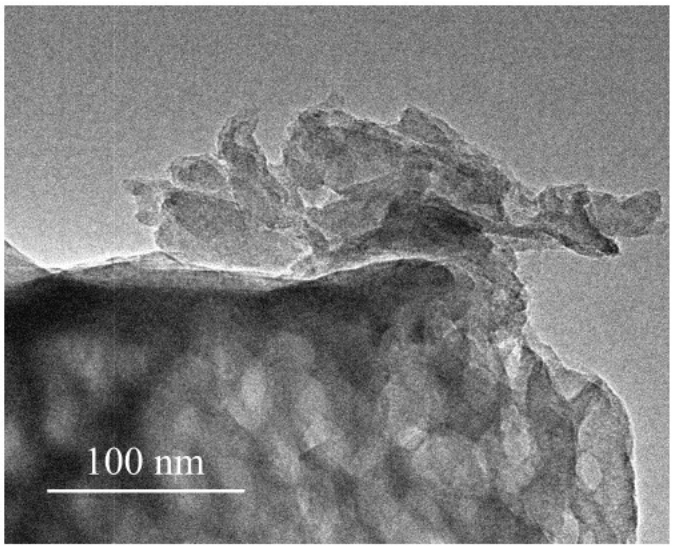

Figure S2 TEM image of 3Mn-ClCN;

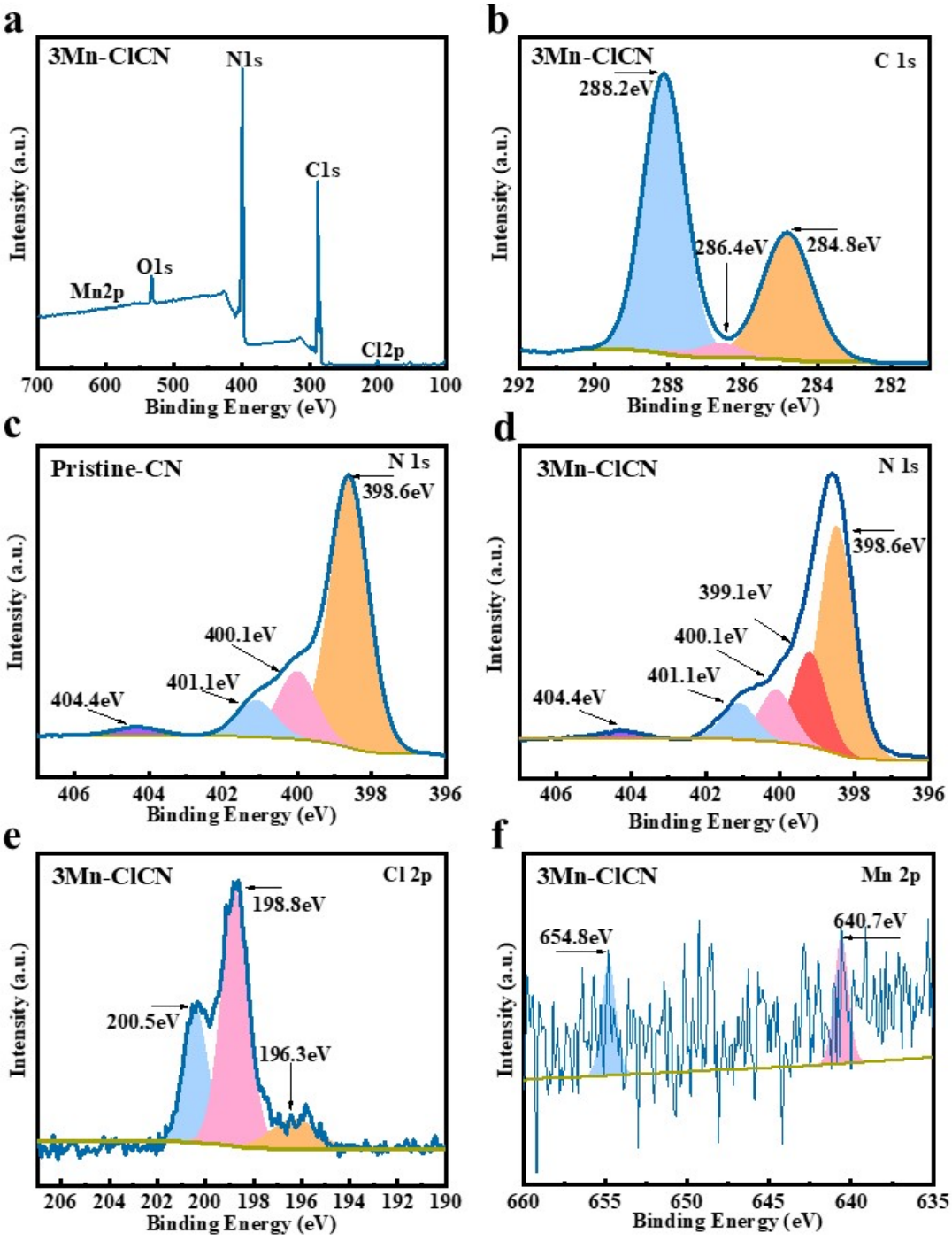

Figure S3 XPS spectra of (a) 3Mn-ClCN sample; (b) C 1s; (d) Cl 2p, (e) Mn 2p; (c) Pristine-CN sample of N 1s.

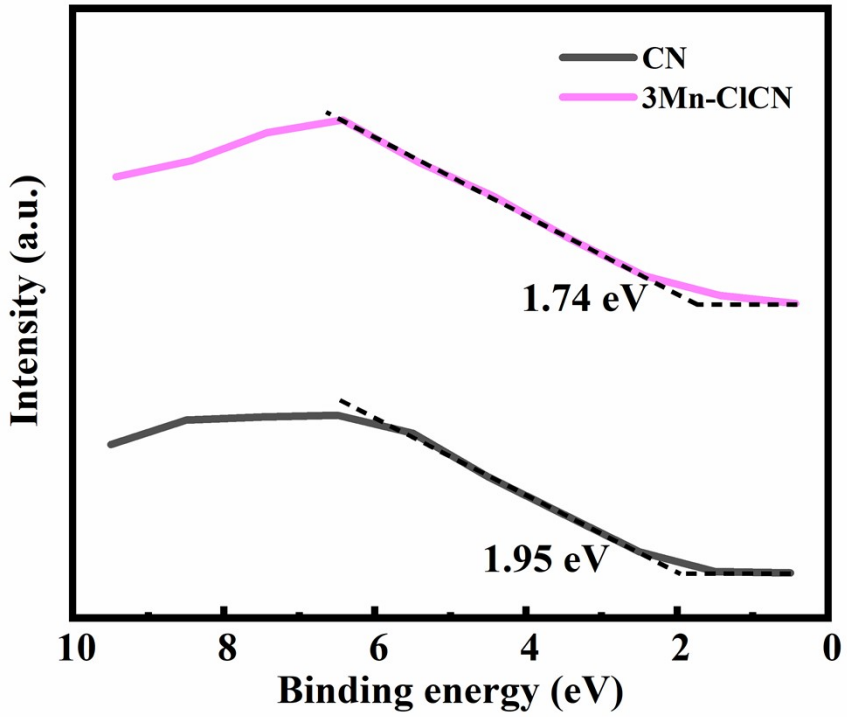

Figure S4 VB-XPS spectra of CN and 3Mn-ClCN.

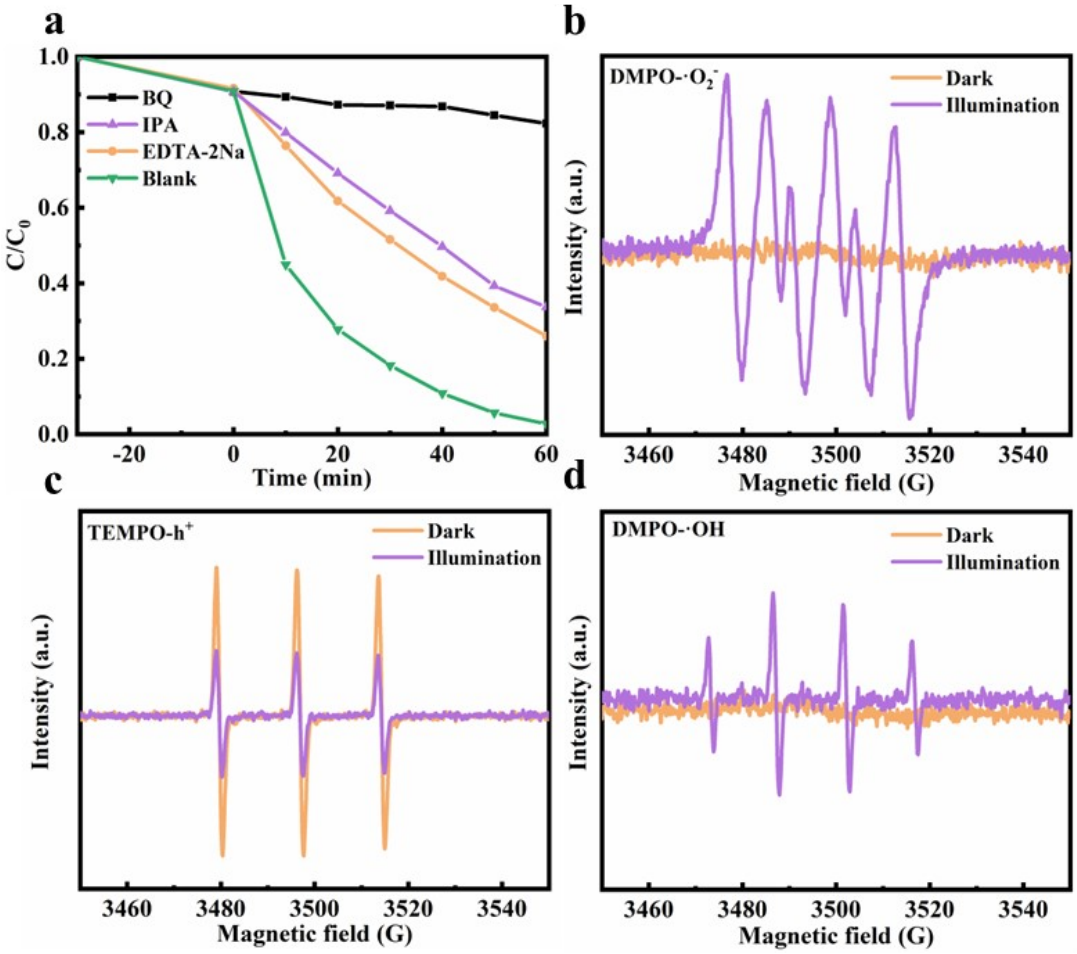

Figure S5 (a) RhB degradation under radical capture conditions with Mn–PCN, (b)EPR spectra of 3Mn-ClCN for (b)DMPO-·O_2^-, (c) TEMPO-h^+ and (d) DMPO-·OH.

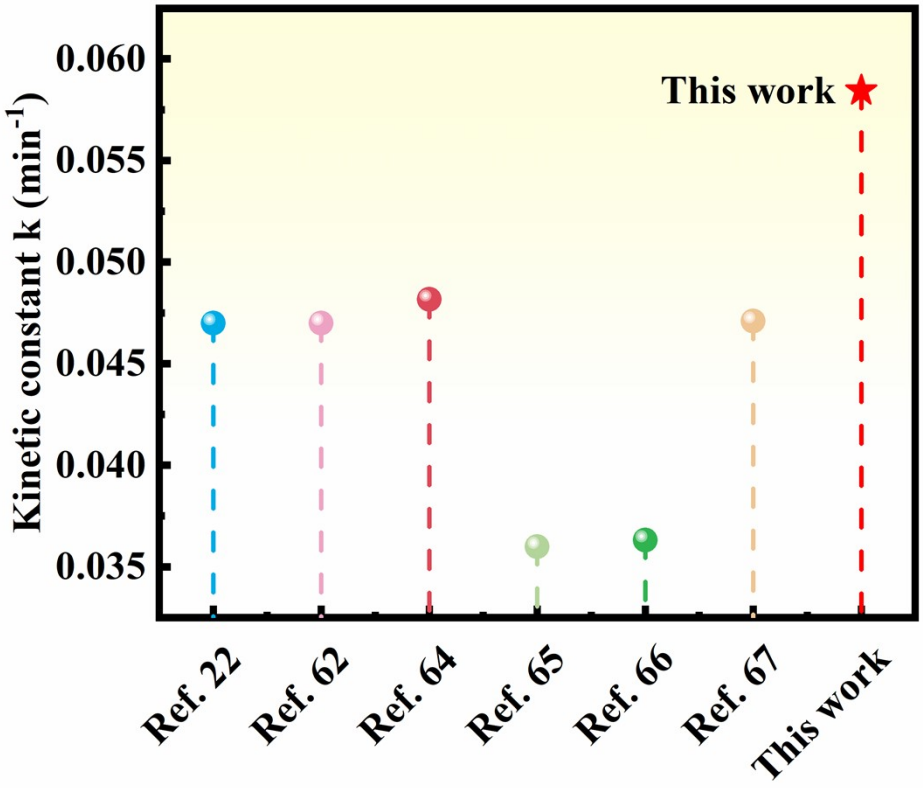

Figure S6 Different literature for the kinetic constant K.

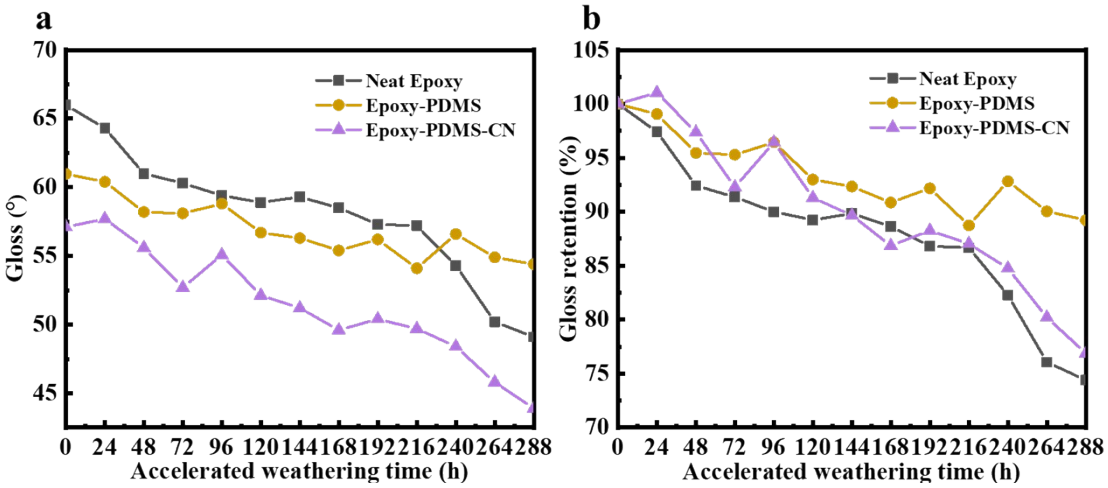

Figure S7 (a)Gloss of coatings; (b) Gloss retention of coatings.