Supplementary material

Eco-friendly Photocatalytic Treatment of Brilliant Blue R with Silver Nanoparticles obtained from *Spirulina platensis*

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Table S1 XRD values and crystalline size of the detected Ag phase in Ag NPs BC.

2 Theta (Degree)	FWHM(Degree)	Crystallite size (nm) Scherrer	Crystallite size (nm) Williamson-Hall
38.25353	0.68627	12.79689	
44.414045	1.00547	8.91337	8.33716
64.60328	0.71819	13.66832	

Table S2 XRD values and crystalline size of the detected Ag phase Ag NPs AC.

2 Theta (Degree)	FWHM (Degree)	Crystallite size (nm) Scherrer	Crystallite size (nm) Williamson-Hall
38.35257	0.31616	28.29925	
44.51805	0.35026	25.59619	35.75713
64.66177	0.406096	24.18089	
77.63152	0.52668	20.21935	

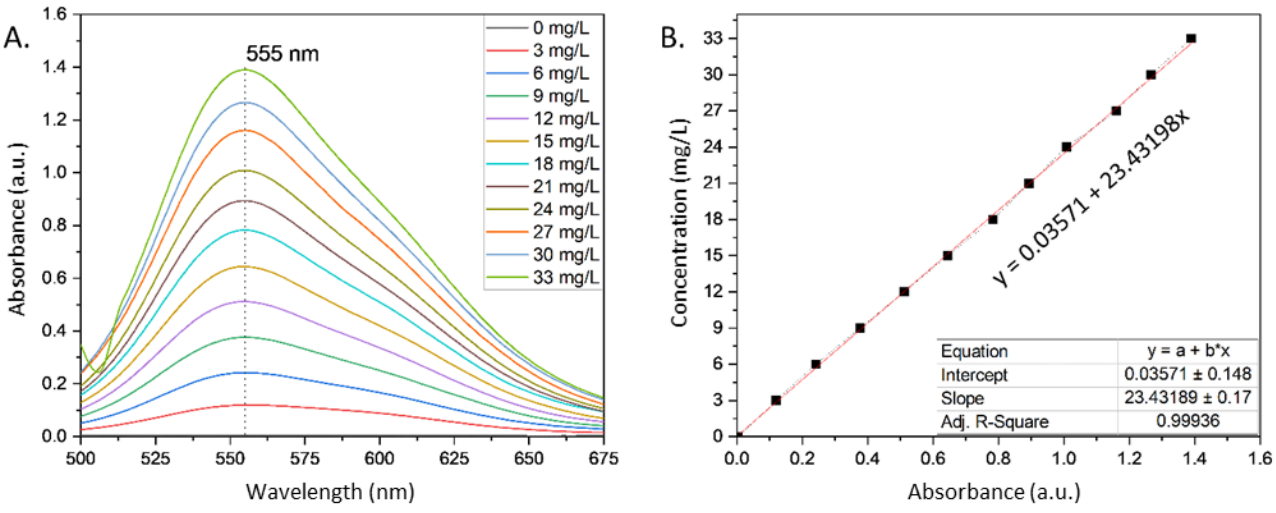


Figure S1. Calibration line (A) absorbance profile of BBR dye at different concentrations, (B) plot of concentration at the maximum absorbance peak at 555 nm.

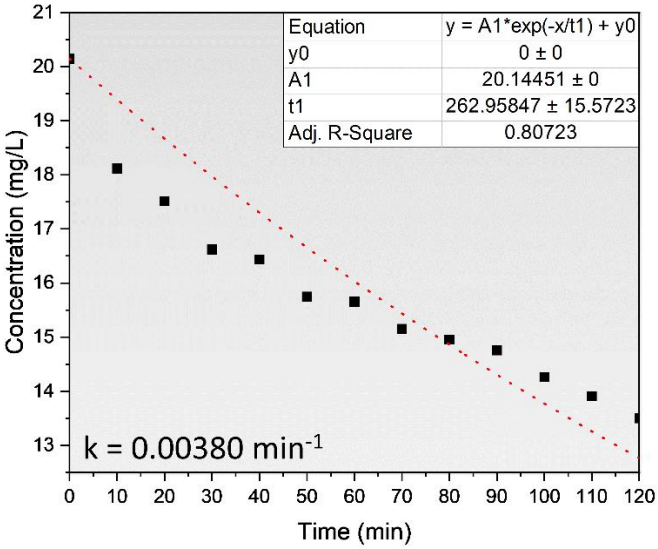


Figure S2. Rate constant in the dark conditions. Fitted parameters were calculated based on the dotted red plot.

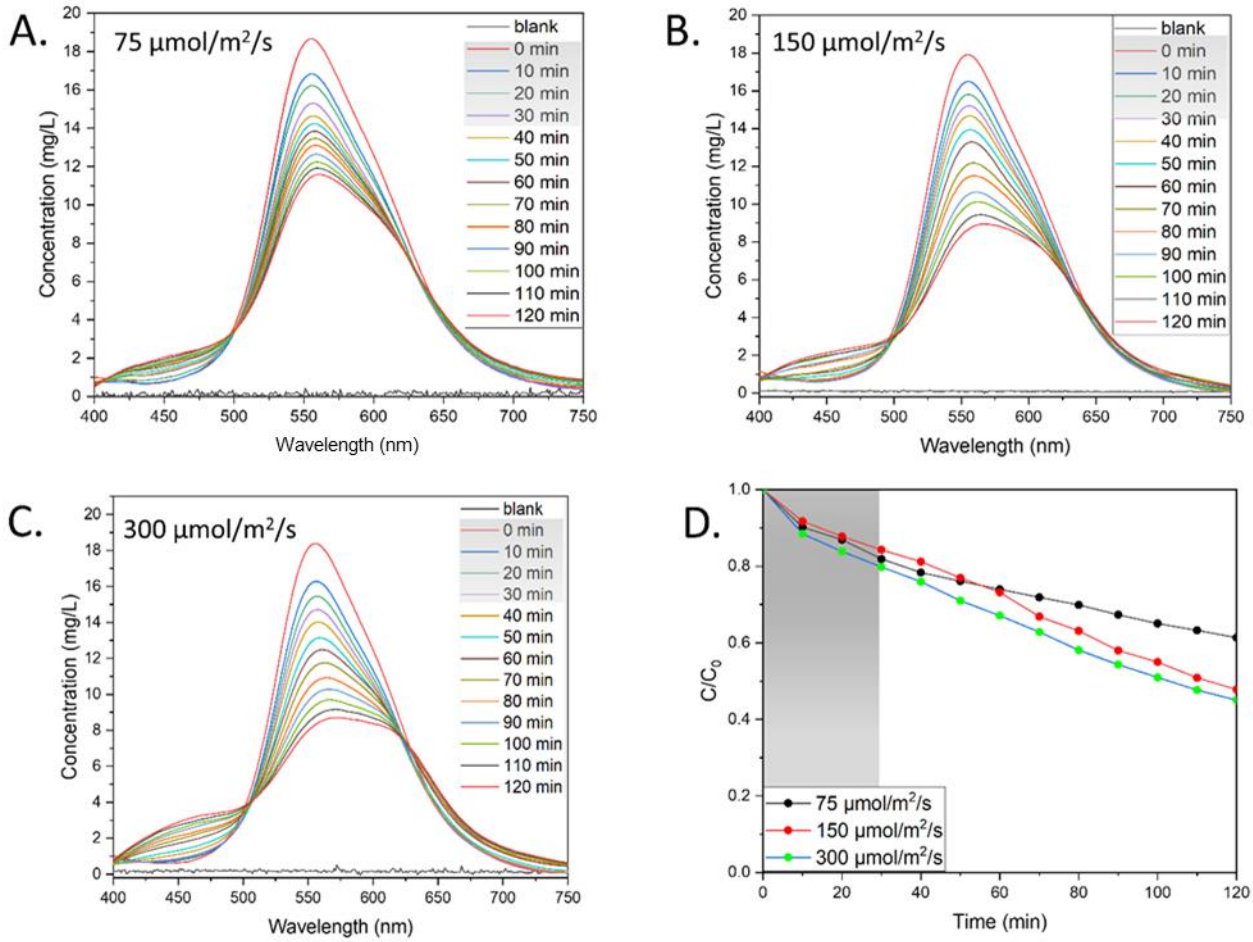


Figure S3 Influence on light on the photocatalytic activity (A-C) UV–Vis spectral changes in the varying light irradiation, (D) changes in dye concentration. Reaction conditions: dye concentration: 18-19 mg/L, Ag NPs BC concentration: 1000 mg/L, pH: 7.

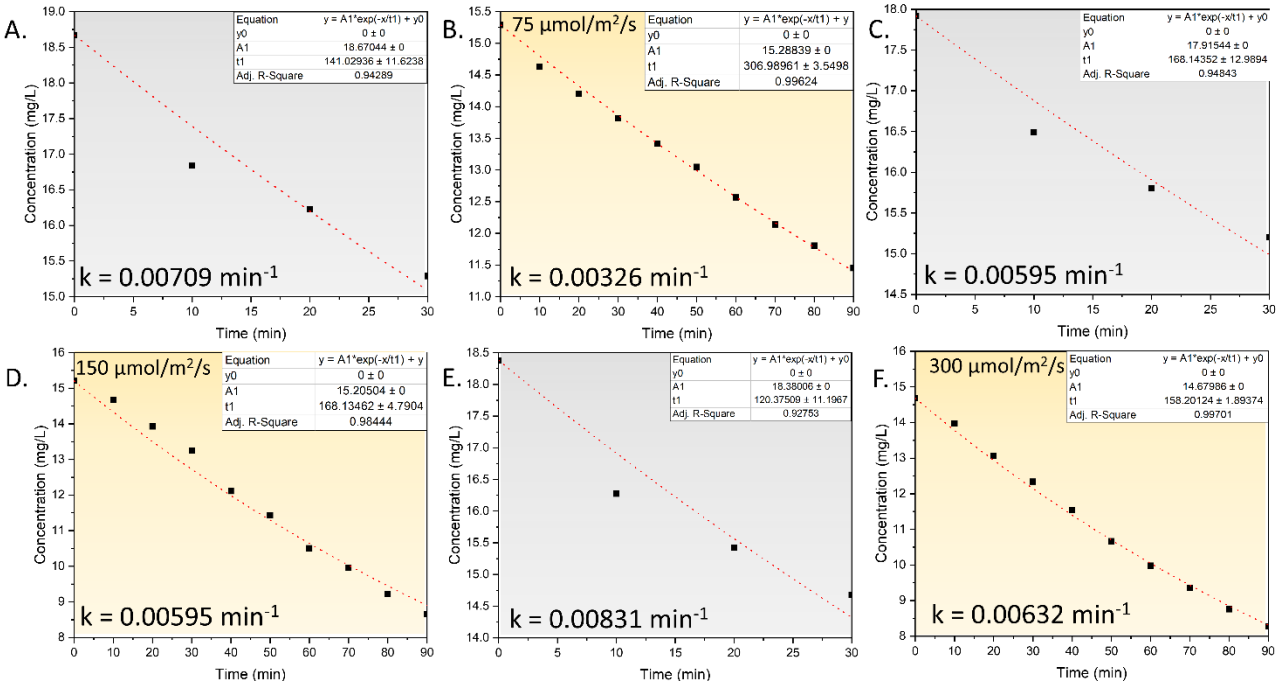


Figure S4. Rate constant at different light intensities, (A) dark, (B) 75 µmol/m²/s, (C) dark, (D) 150 µmol/m²/2, (E) dark, (F) 300 µmol/m²/s. Fitted parameters were calculated based on the dotted red plot.

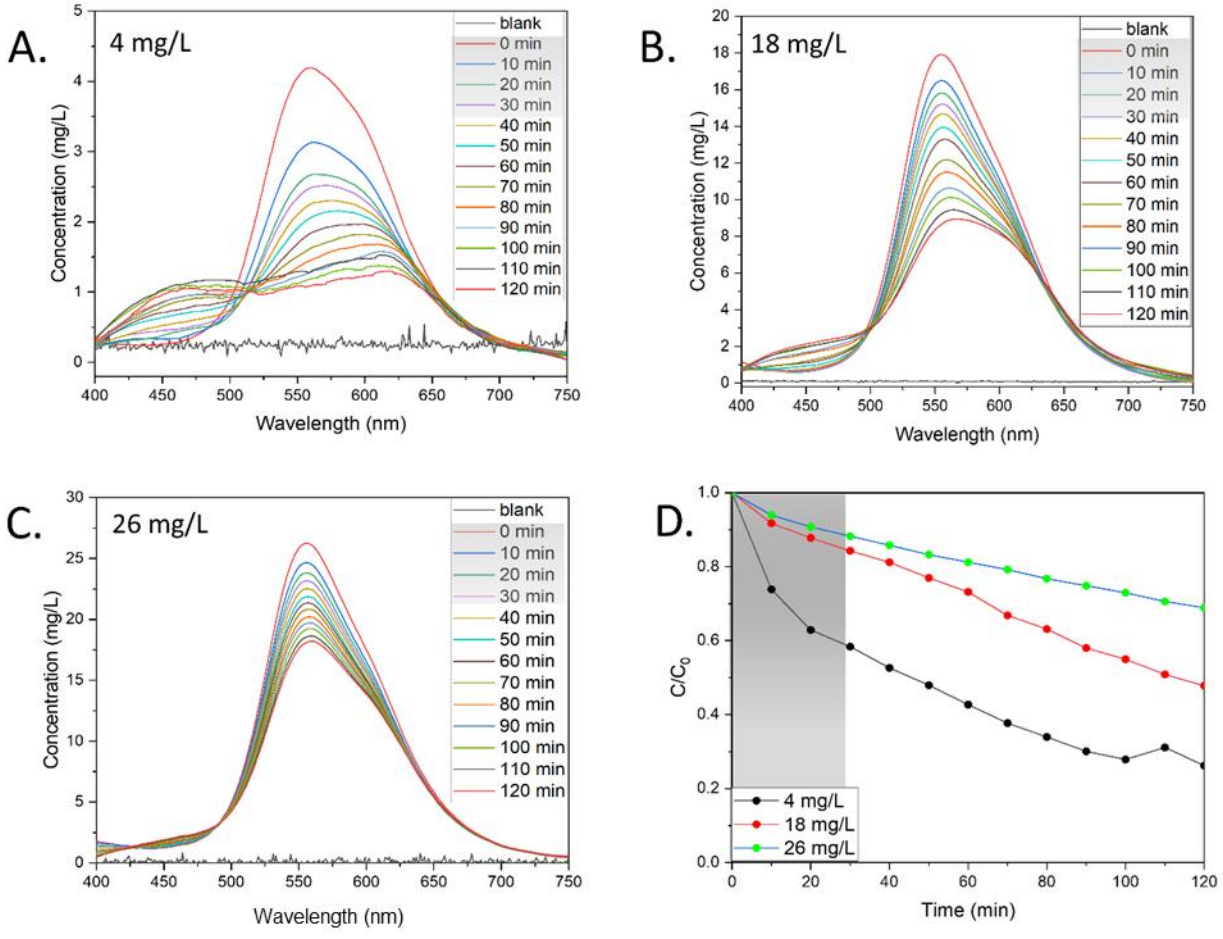


Figure S5 Influence of dye concentration on the photocatalytic activity (A-C) UV–Vis spectral changes in the varying dye concentration, (D) changes in dye concentration. Reaction conditions: Ag NPs BC concentration: 1000 mg/L, light intensity: 150 µmol/m²/s, pH: 7.

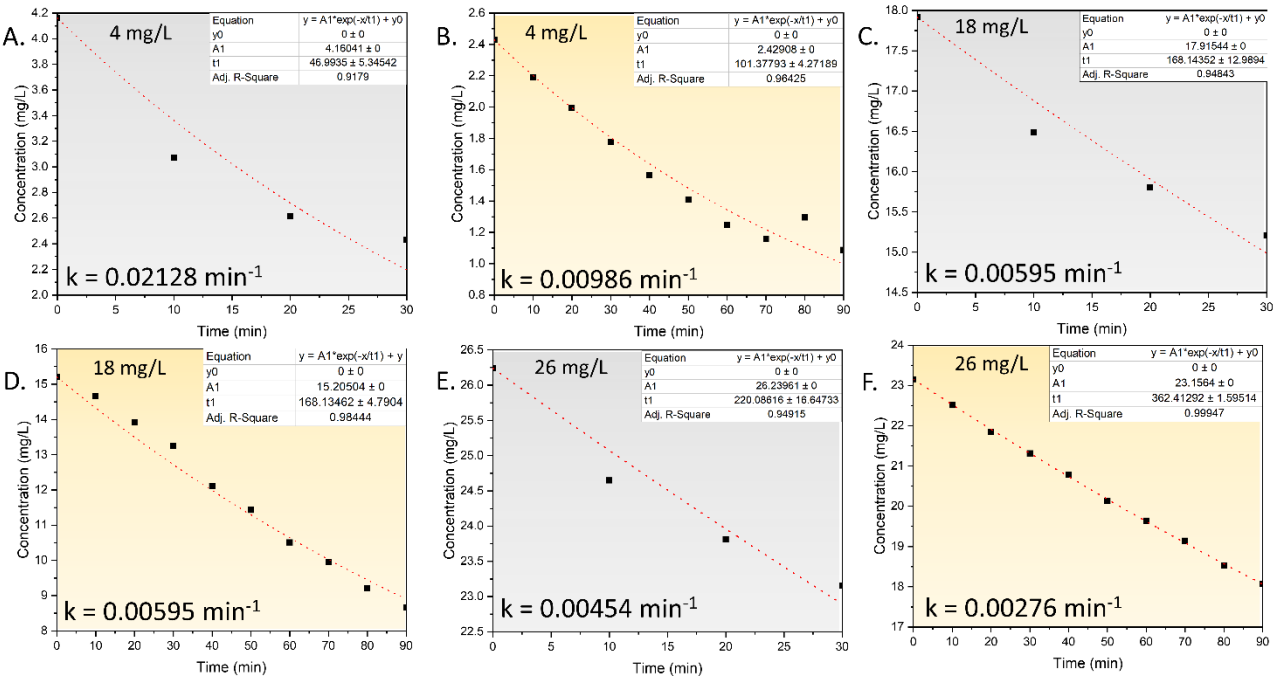


Figure S6. Rate constant at different dye concentrations (A) 4 mg/L in the dark, (B) 4 mg/L in the light, (C) 18 mg/L in the dark, (D) 18 mg/L in the light, (E) 26 mg/L in the dark, (F) 26 mg/L in the light. Fitted parameters were calculated based on the dotted red plot.

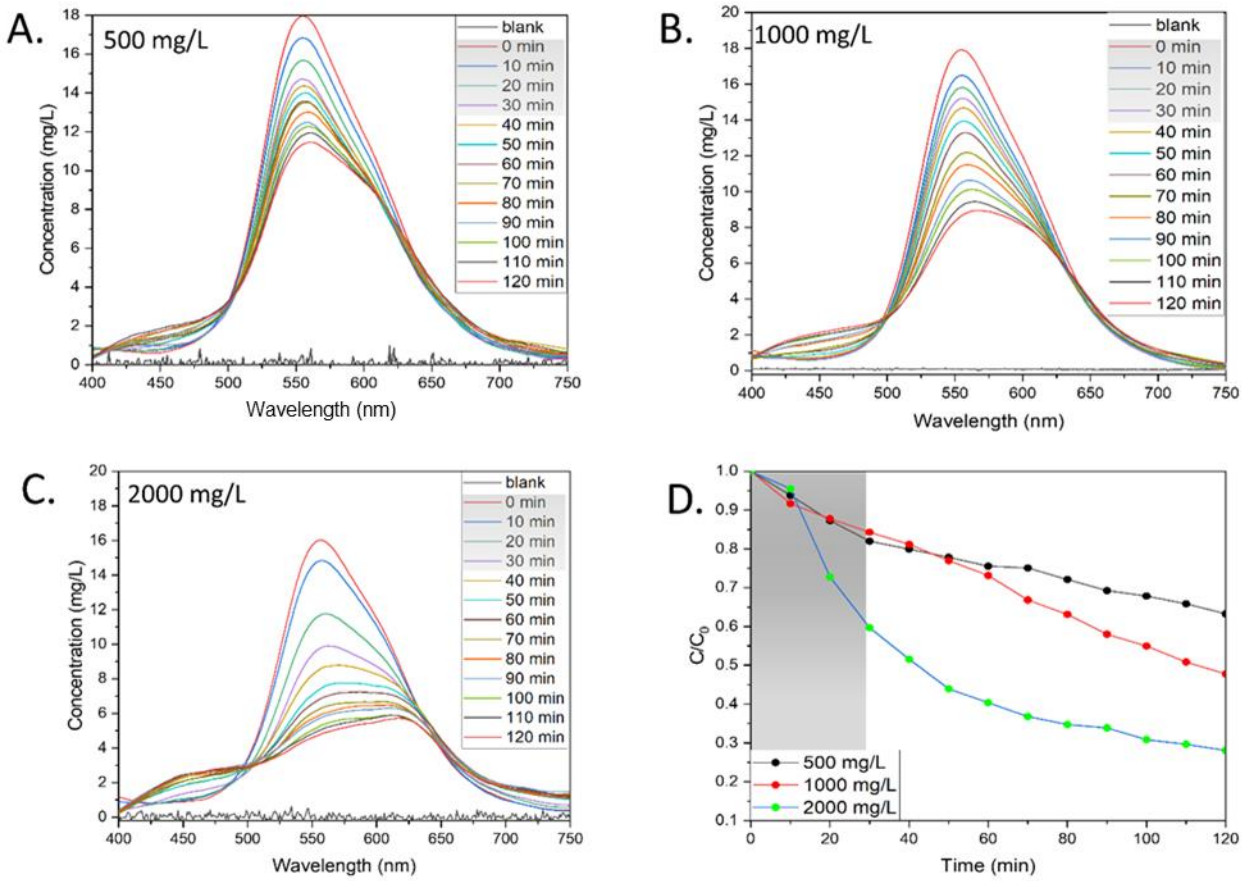


Figure S7 Influence of catalyst concentration on the photocatalytic activity (A-C) UV–Vis spectral changes in the varying catalyst concentration, (D) changes in dye concentration. Reaction conditions: dye concentration: 16-18 mg/L, light intensity: 150 µmol/m^2/s, pH: 7.

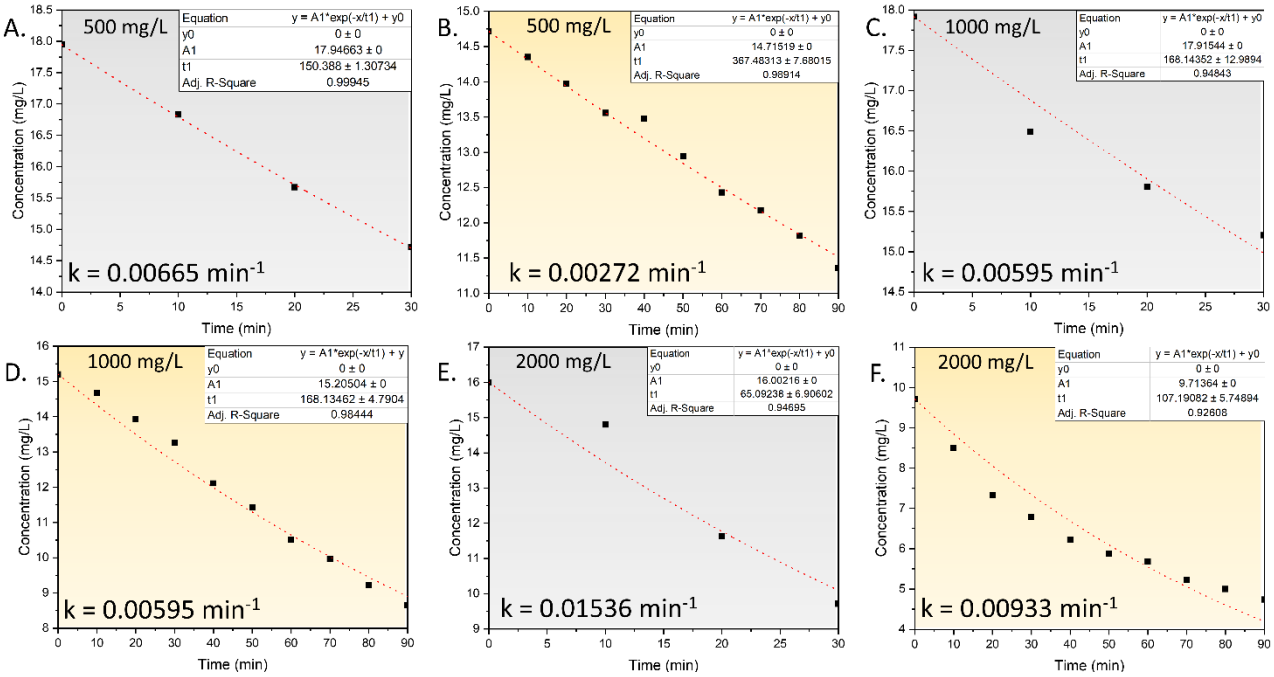


Figure S8. Rate constant in different catalyst loadings, (A) 500 mg/L in the dark, (B) 500 mg/L in the light, (C) 1000 mg/L in the dark, (D) 1000 mg/L in the light, (E) 2000 mg/L in the dark, (F) 2000 mg/L in the light. Fitted parameters were calculated based on the dotted red plot.

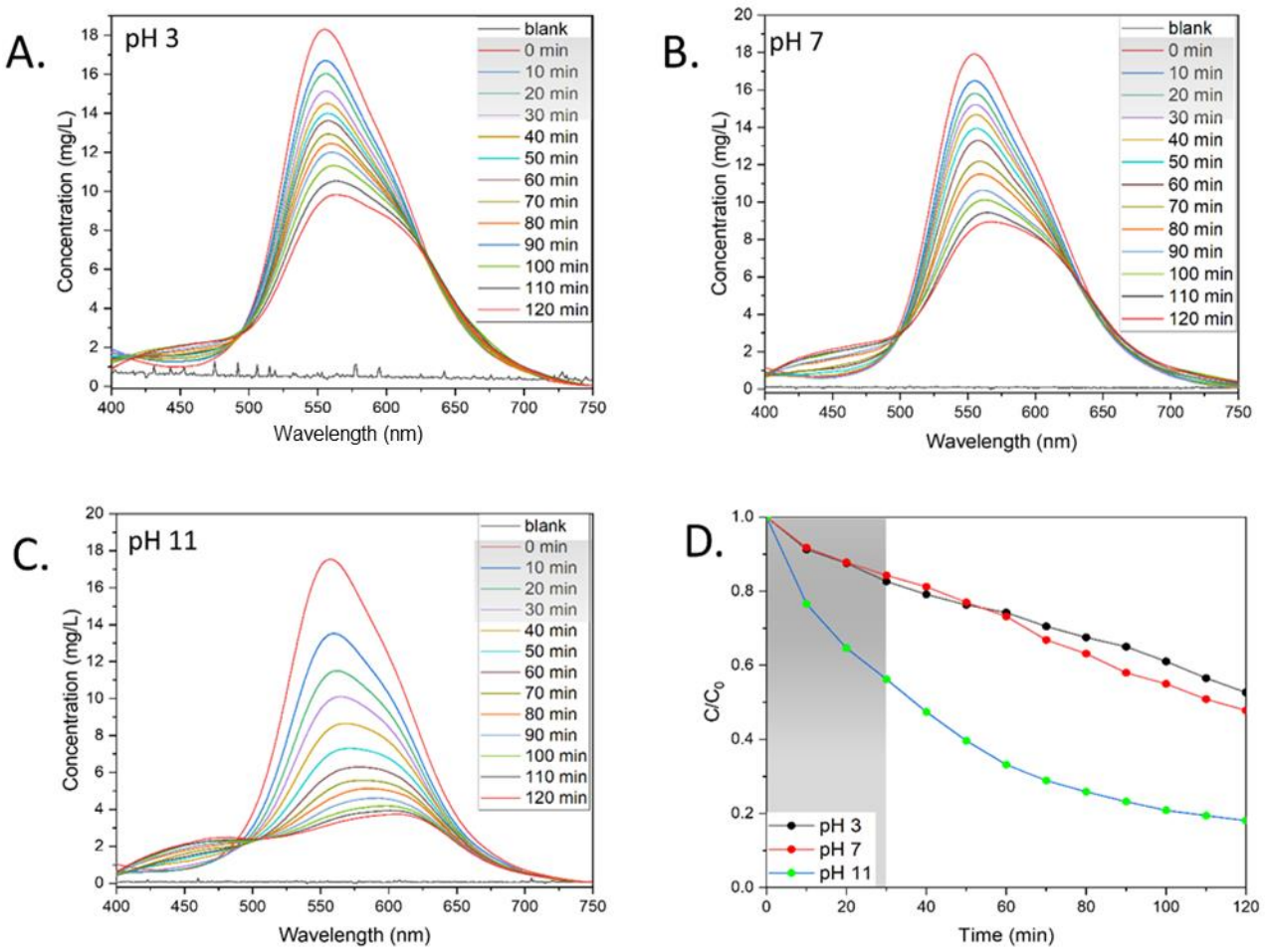


Figure S9 Influence of pH on the photocatalytic activity (A-C) UV–Vis spectral changes in the varying pH, (D) changes in dye concentration. Reaction conditions: dye concentration: 18-19 mg/L, Ag NPs BC concentration: 1000 mg/L, light intensity: 150 µmol/m^2/s.

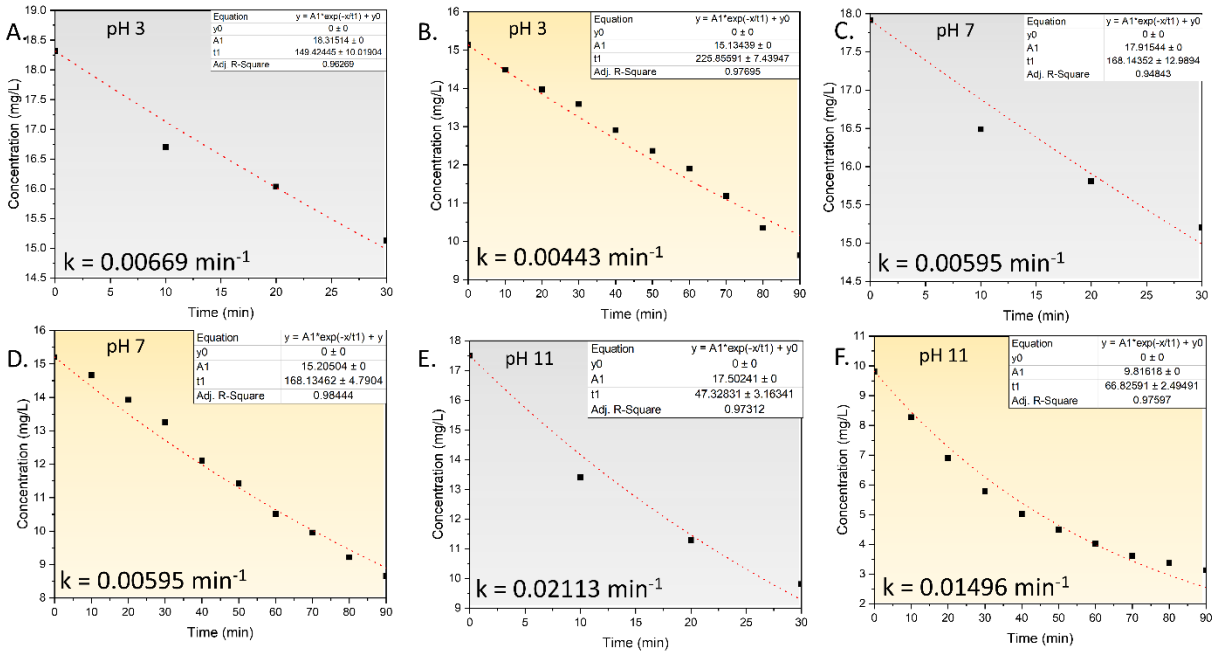


Figure S10. Rate constant in the different pH, (A) pH 3 in the dark, (B) pH 3 in the light, (C) pH 7 in the dark, (D), pH 7 in the light, (E) pH 11 in the dark, (F) pH 11 in the light. Fitted parameters were calculated based on the dotted red plot.

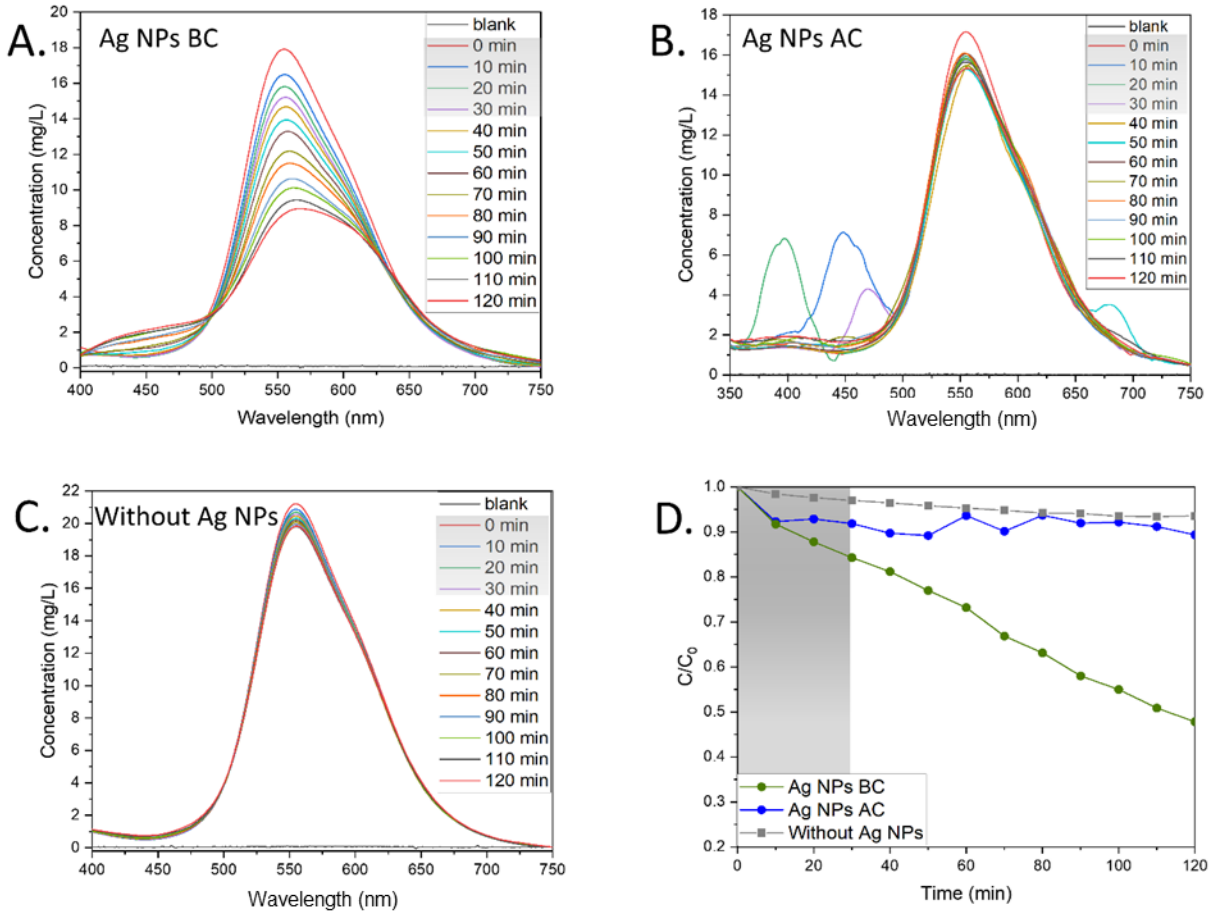


Figure S11 Influence of calcination on the photocatalytic activity (A) UV–Vis spectral changes before calcination, (B) UV–Vis spectral changes after calcination, (C) UV–Vis spectral changes without catalyst, (D) changes in dye concentration. Reaction conditions: dye concentration: 17-22 mg/L, Ag NPs BC concentration: 1000 mg/L, light intensity: 150 µmol/m^2/s, pH: 7.

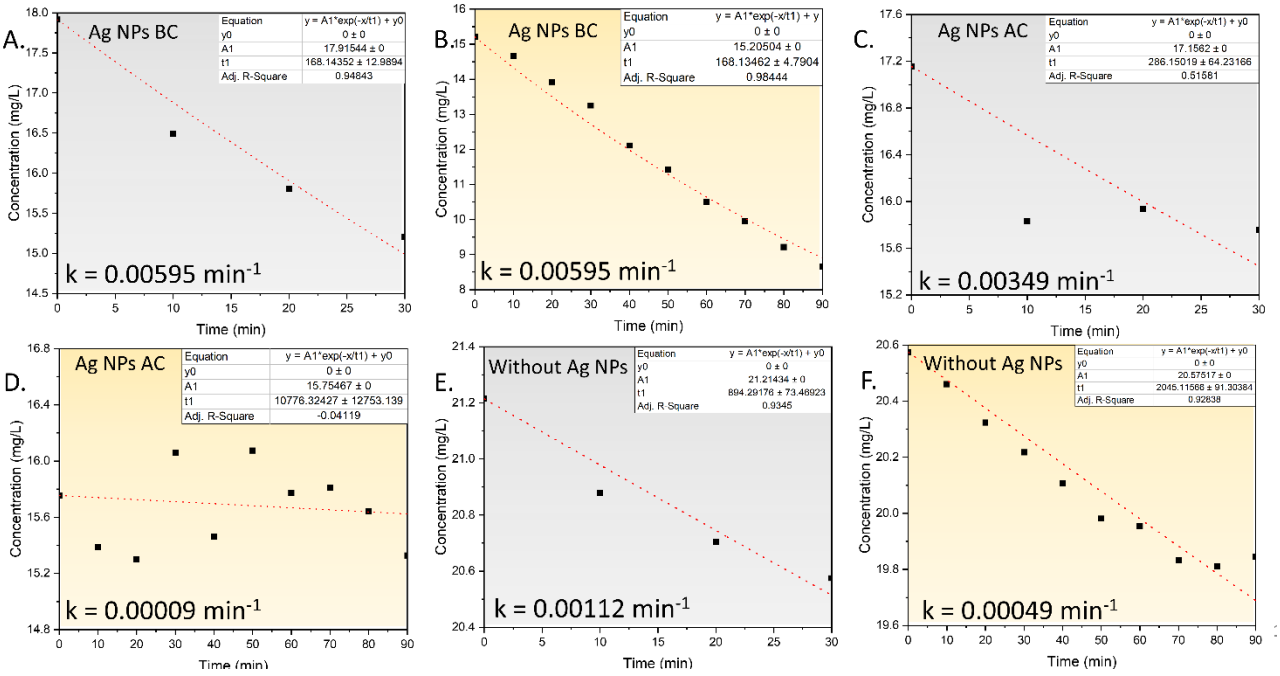


Figure S12. Rate constant (A) Ag NPs BC in the dark, (B) Ag NPs BC in the light, (C) Ag NPs AC in the dark, (D) Ag NPs AC in the light, (E) without Ag NPs in the dark, (F) without Ag NPs in the light. Fitted parameters were calculated based on the dotted red plot.