Supporting Information

Sensitively monitoring photodegradation of organic dye molecules by surface-enhanced Raman scattering

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![Figure S1. Reaction kinetics study of photocatalytic degradation of CV over Fe\textsubscript{3}O\textsubscript{4}@SiO\textsubscript{2}@TiO\textsubscript{2}@Ag by SERS: the ln (−(\partial(I/I_0)/(\partial t)(1/\eta)) versus ln(I/I_0) plot in which the slope of the linearly fitted line corresponds to the reaction order with respect to CV (n), indicating first-order kinetics.](image)

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Figure S2. Reaction rate constants study of photocatalytic degradation of CV over Fe₃O₄@SiO₂@TiO₂@Ag by SERS: Time-dependent of SERS spectra of the CV solution on Fe₃O₄@SiO₂@TiO₂@Ag (left) and plots of the Raman intensity at 1172 cm⁻¹ versus reaction time (ln(I/I₀) vs. t plot) for the photocatalytic degradation of CV (right) in the presence of Fe₃O₄@SiO₂@TiO₂@Ag composite.

Figure S3. (A) Time-dependent UV-vis absorbance spectra of CV solution in the presence of Fe₃O₄@SiO₂@TiO₂@Ag composites after exposure to UV light for different durations. (B) Photodegradation rates of CV in the absence of catalysts (a), in the presence of Fe₃O₄@SiO₂@TiO₂ (b) and the Fe₃O₄@SiO₂@TiO₂@Ag composites (c). The initial concentrations of CV solution was 1.0×10⁻⁵ M.