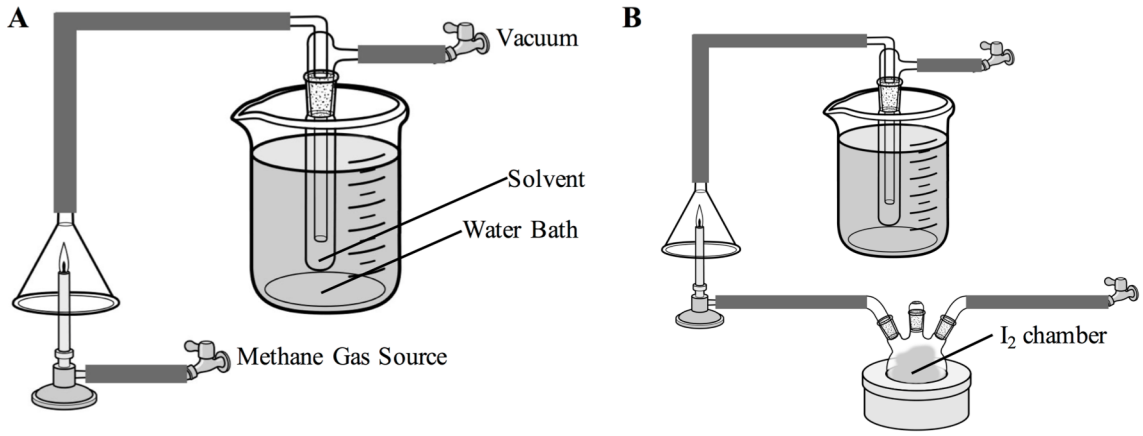

Scheme S1. Experimental production of carbon nanodots. **A** – Standard collection method. **B** – Altered production method for collection of iodated nanodots.

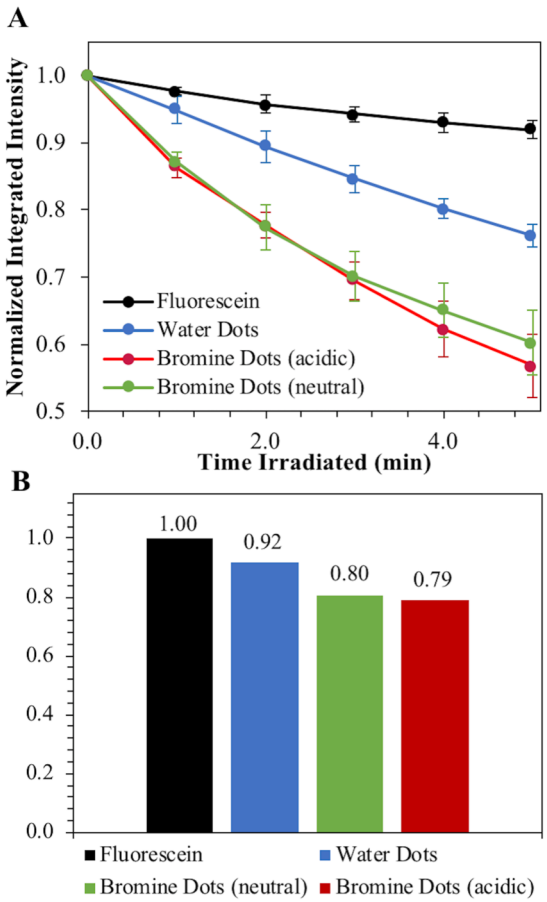

Figure S1. Photostability of carbon nanodot structures relative to 32.3 µM Fluorescein. Absorption values were matched for each sample at the excitation wavelength (λ_{ex} = 405 nm, 5 mW) with <1% deviation from average absorption. **A –** Normalized emission intensity decay over time, integrated from 450 – 600 nm per each time point. **B –** Normalized integration values of A, demonstrating cumulative emission intensity during 5 minutes of irradiation. Fluorescein was used as the normalization standard.

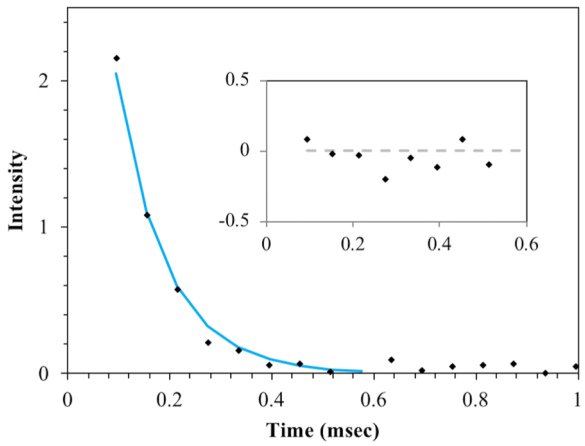

Figure S2. Phosphorescence intensity decay of brominated carbon nanodots (4hr) with single exponential fit. Inset represents the fit residuals. Collection parameters: λ_{ex} = 300nm, λ_{em} = 550 nm, Gate time = 0.05 msec, Delay time = 0.07 msec.

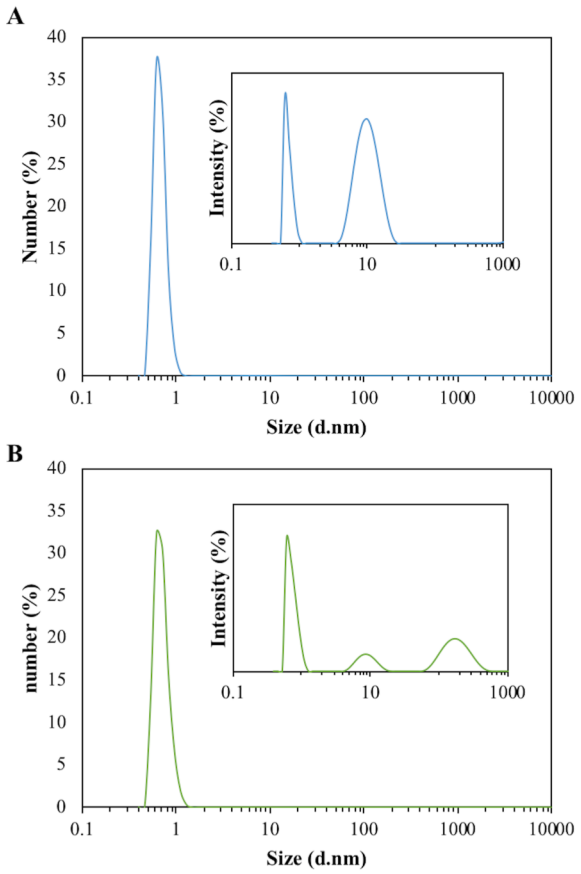

Figure S3. Diameter of carbon nanodot structures as analyzed by dynamic light scattering techniques. **A –** Size distribution by number of carbon nanodots collected into water. The inset is distribution by intensity. **B –** Size distribution by number of brominated carbon nanodots. The inset is distribution by intensity.

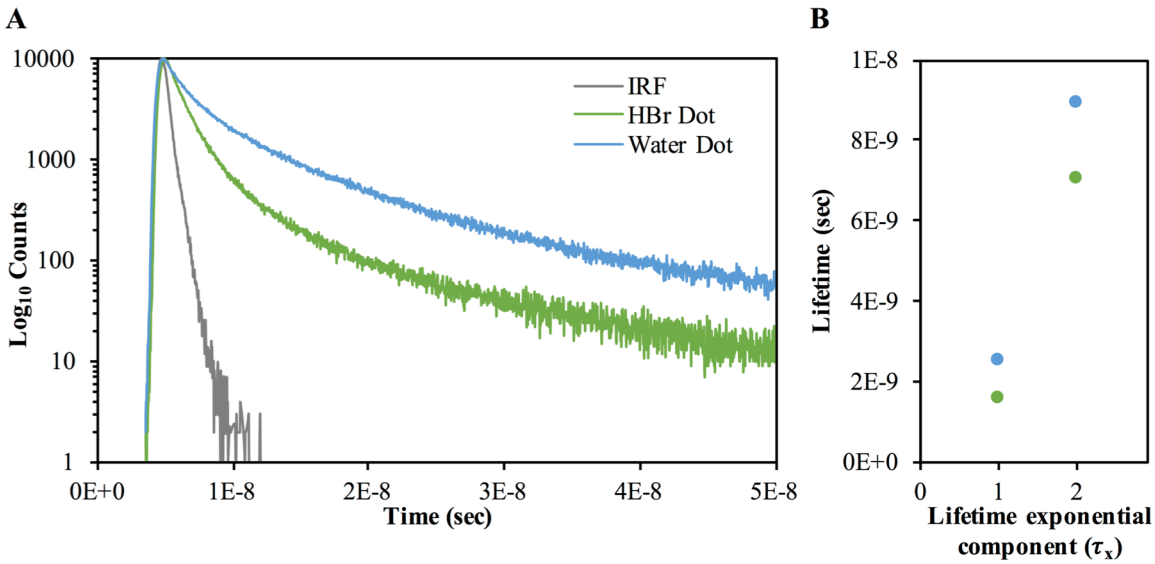

Figure S4. Fluorescence intensity decays ($\lambda_{ex,em}$ = 311/350 nm) of carbon nanodots collected into water versus heavy carbon nanodots collected into 5M HBr over a 4 hour burn time. Samples were taken into glycerol and then analyzed at an equivalent pH. **A** – Intensity decays analyzed by TCSPC method. **B** – Plot of reported lifetime versus exponential component of decay model.

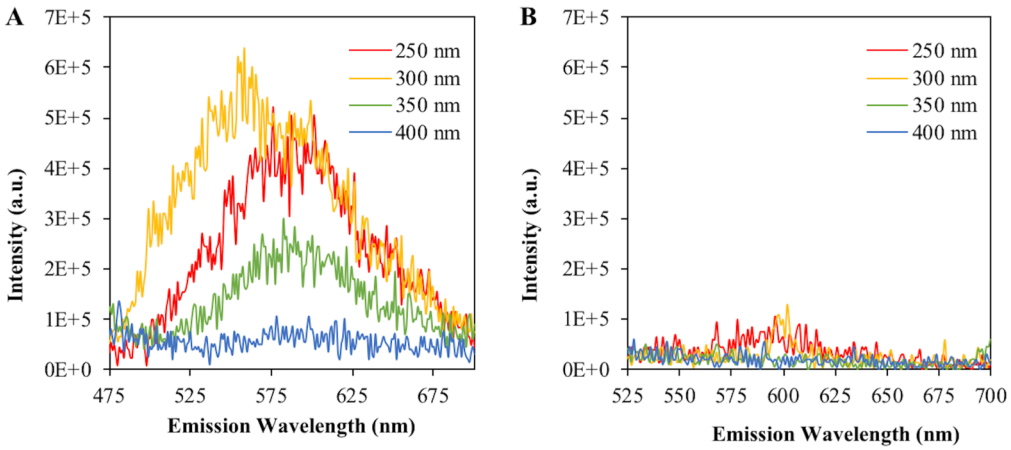

Figure S5. Phosphorescence emission spectra for heavy carbon nanodots collected into 5M HBr versus that of carbon nanodots collected into water. Both samples were taken into glycerol and analyzed at at equivalent pH values for excitation wavelengths including 250, 300, 350, and 400 nm. **A** – Emission spectra versus wavelength for heavy carbon nanodots. **B** – Phosphorescence emission spectra for carbon nanodots collected into water over the same excitation range.

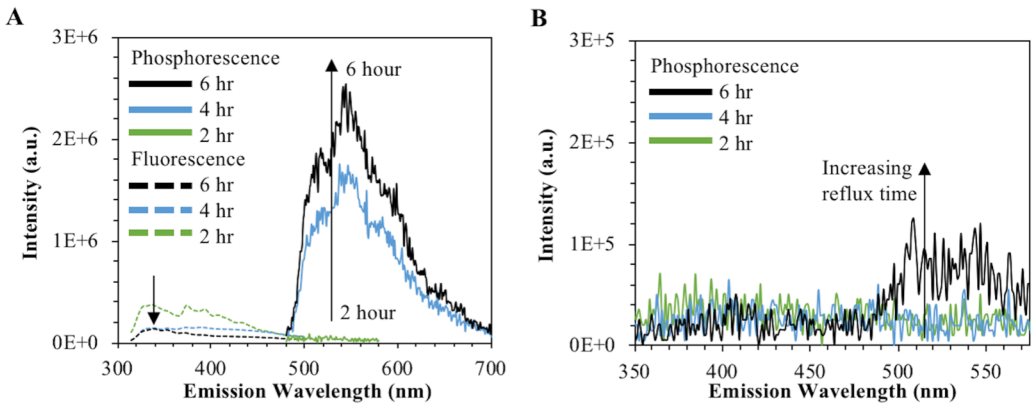

Figure S6. Effect of burn or reaction time on the generation of a phosphorescent signal from heavy carbon nanodots collected into 5M HBr, excited at 300 nm. **A** – Luminescence emission spectra for samples of 2, 4, and 6 hour burn times, collected directly into 5M HBr. **B** – Phosphorescence emission spectra for samples collected over a 2, 4, and 6 hour burn time collected first into water, then refluxed with 5M HBr for 2, 4, and 6 hour time increments. It should be noted that the scale between A and B differ by an order of magnitude.

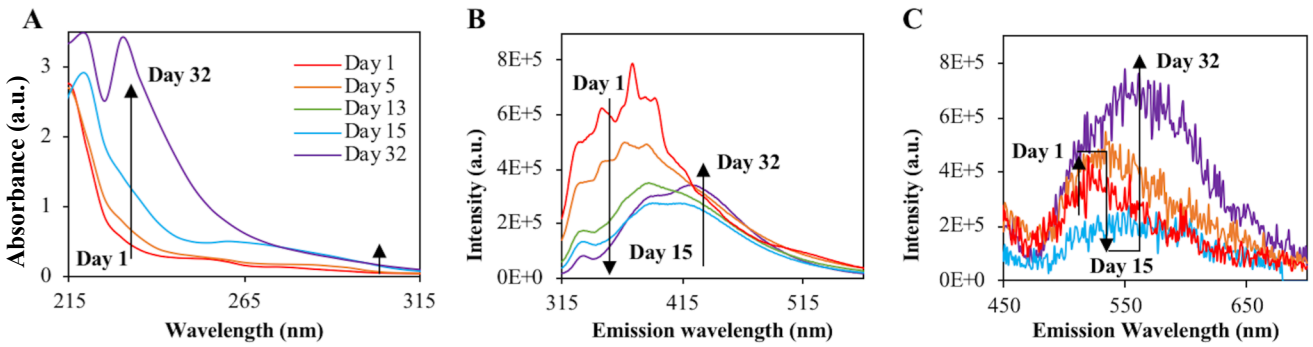

Figure S7. Luminescence stability of heavy carbon nanodots collected into 5M HBr for 4 hours. The sample was prepared as a glycerol mixture and kept stirring just above room temperature for the period of 1 month. The sample was periodically removed, analyzed, and returned to the mixing conditions. **A** – Sample absorbance. **B** – Sample fluorescence, excited at 300 nm. **C** – Sample phosphorescence, excited at 300 nm.

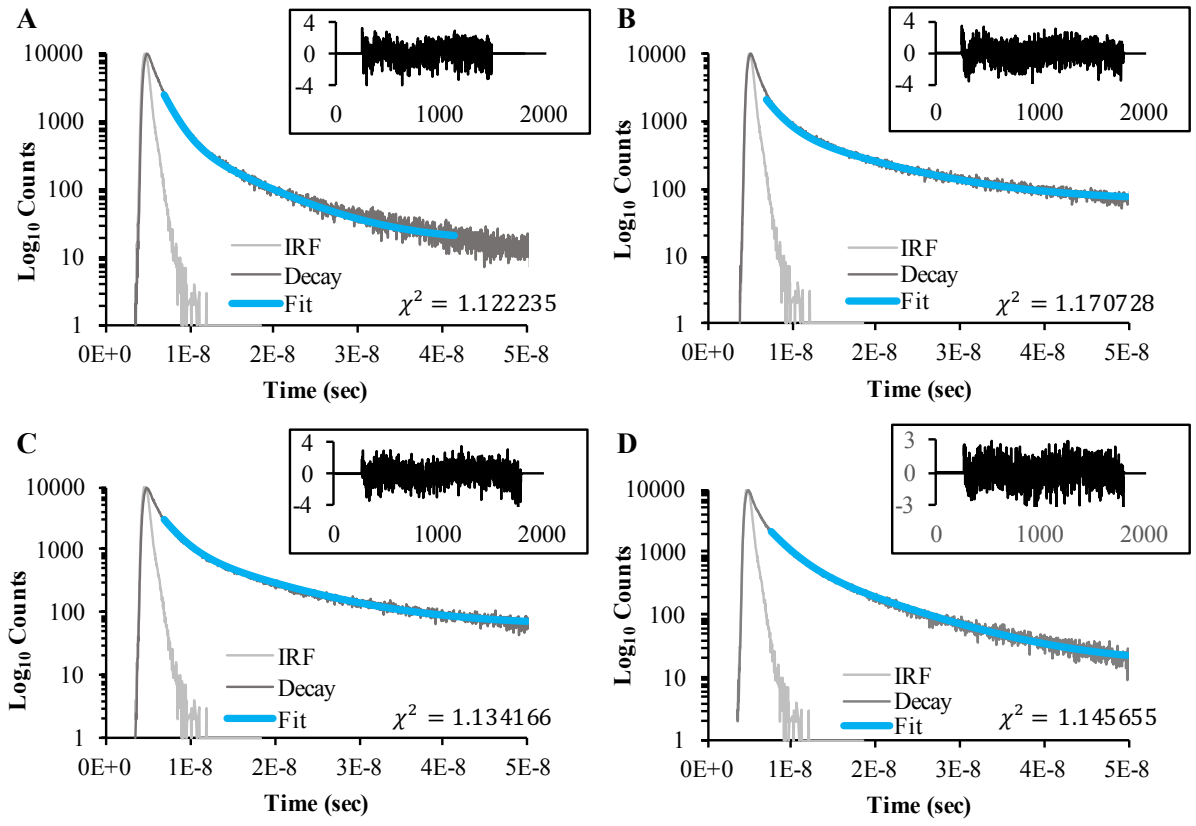

Figure S8. Analysis of fluorescence intensity decays of brominated carbon nanodots collected into 5M HBr over 4 hours. Samples were pH adjusted, diluted to equal concentrations, then analyzed in glycerol. Insets indicate residual values for each model fit. (λ_{ex}= 311 $nm, \lambda_{em} > 350\ nm$) **A** – Sample as collected, pH = 0.22. **B** – Basic sample, pH = 13.61. **C** – Acidic sample, pH = 1.28. **D** – Neutral sample, pH = 7.33.

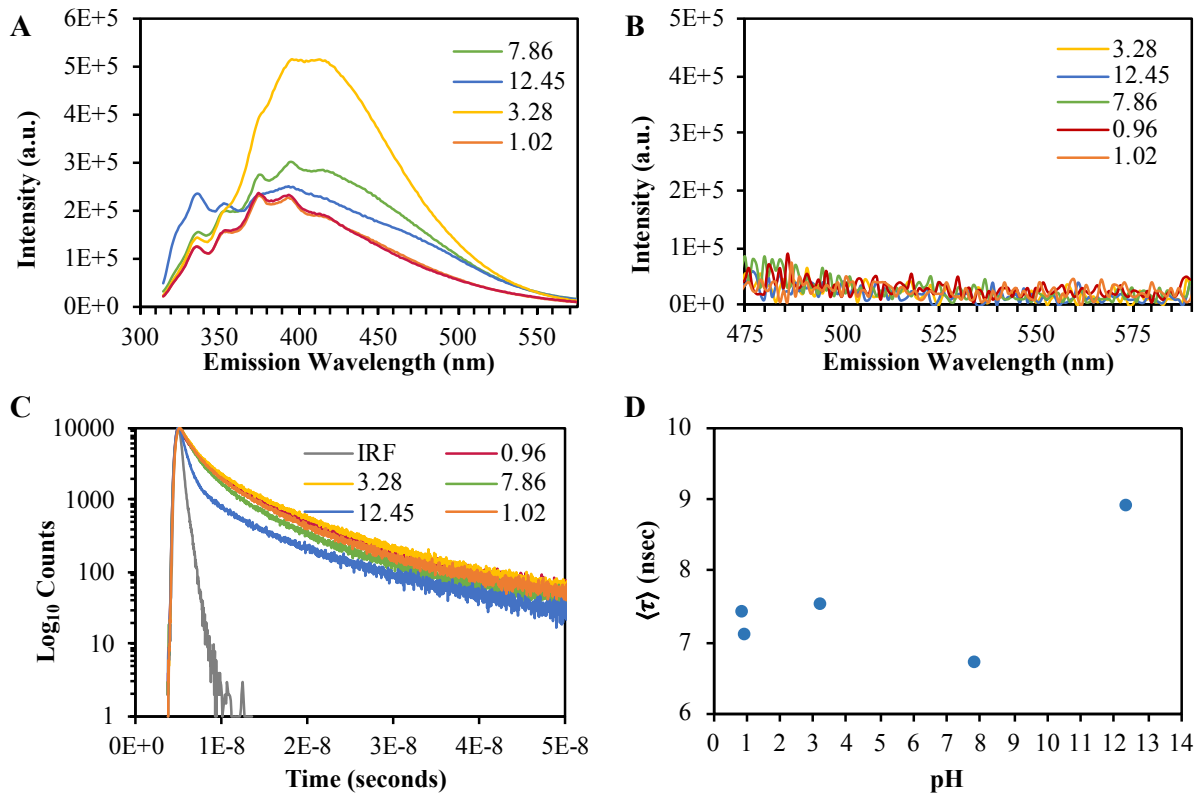

Figure S9. Spectral data for carbon nanodots collected into water for 4 hours and then pH adjusted. **A** – Fluorescence spectra for samples of varying pH. Samples were analyzed in water at 300 nm excitation. **B** – Phosphorescence spectra for samples of varying pH. Samples were analyzed in glycerol at 300 nm excitation. **C** – Fluorescence lifetime decays for samples in glycerol ($\lambda_{ex} = 311\ nm, \lambda_{em} = 350\ nm$). **D** – Chart summarizing the change in amplitude weighted lifetimes ($\langle\tau\rangle$) as a function sample pH.