Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplemental Figures

Heavy Carbon Nanodots 2: Plasmon Amplification in Quanta Plate™ Wells and the Correlation with the Synchronous Scattering Spectrum

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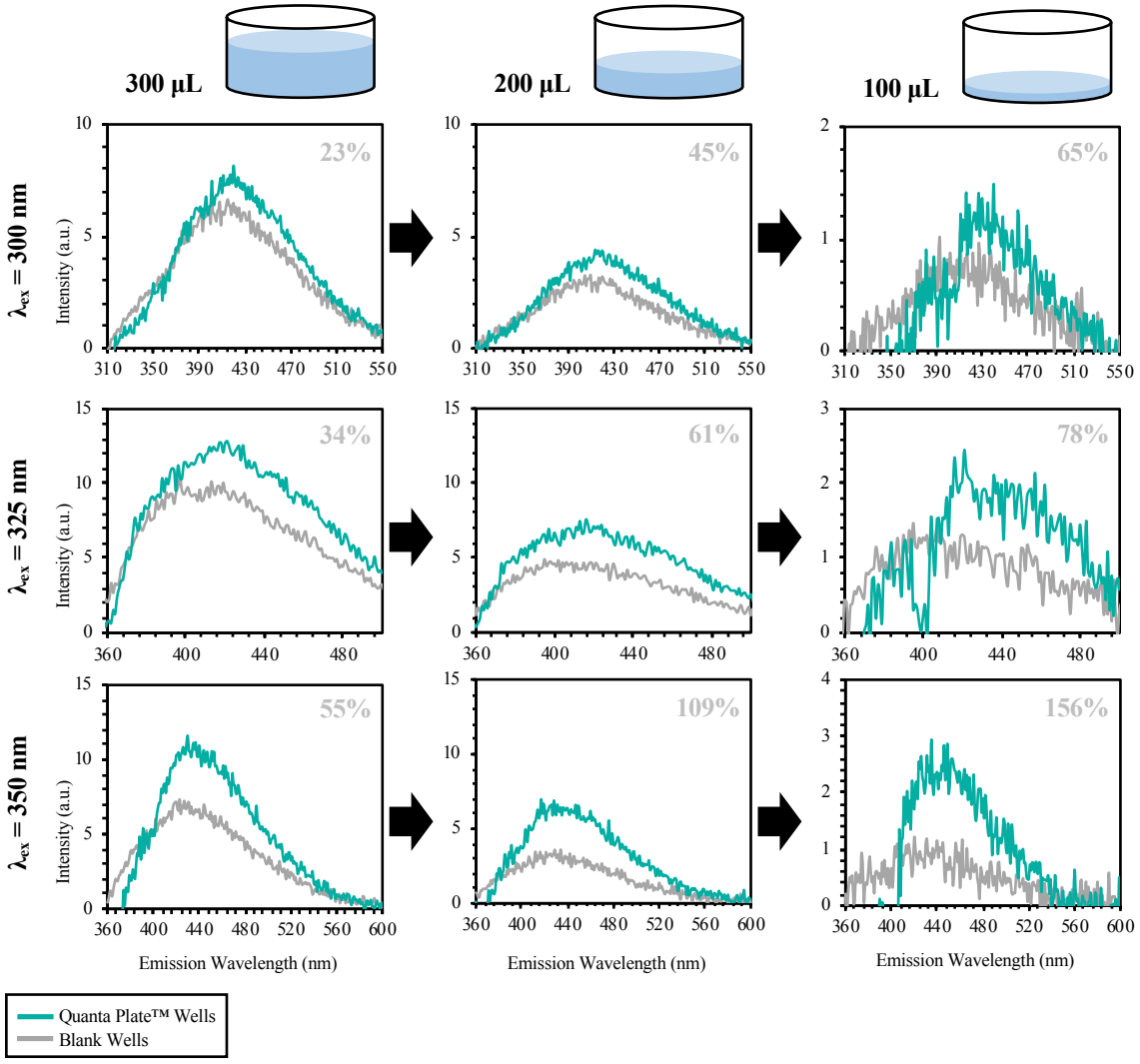

Figure S1. Volume dependence of MEF, demonstrated by the fluorescence emission of water dots in water in silver Quanta Plate™ versus blank wells at varying wavelengths and sample volumes. Percentages listed are integrated percent enhancement from detection on the Quanta Plate™ wells.

Figure S2. Quanta Plate™ plates, used for plasmonic amplification of brominated carbon nanodots.

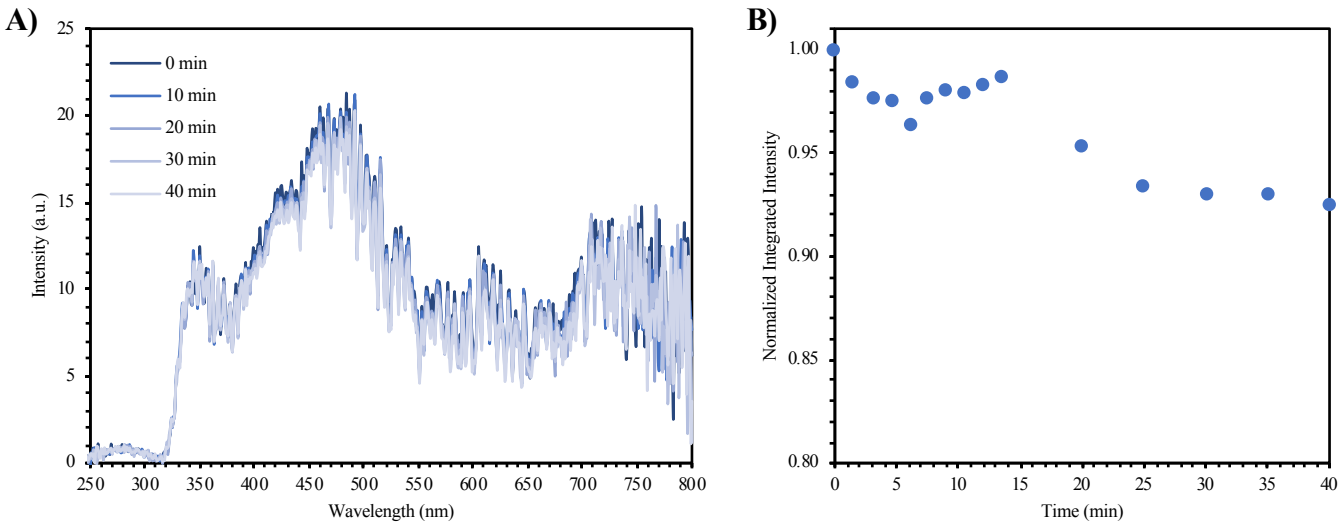

Figure S3. Synchronous scattering spectra of silver Quanta Plate™ wells analyzed over time while exposed to acidified glycerol (pH ~ 1). *A)* Synchronous scattering spectra of silvered wells, analyzed over time. *B)* Normalized integrated intensity of each synchronous scattering spectra over time.

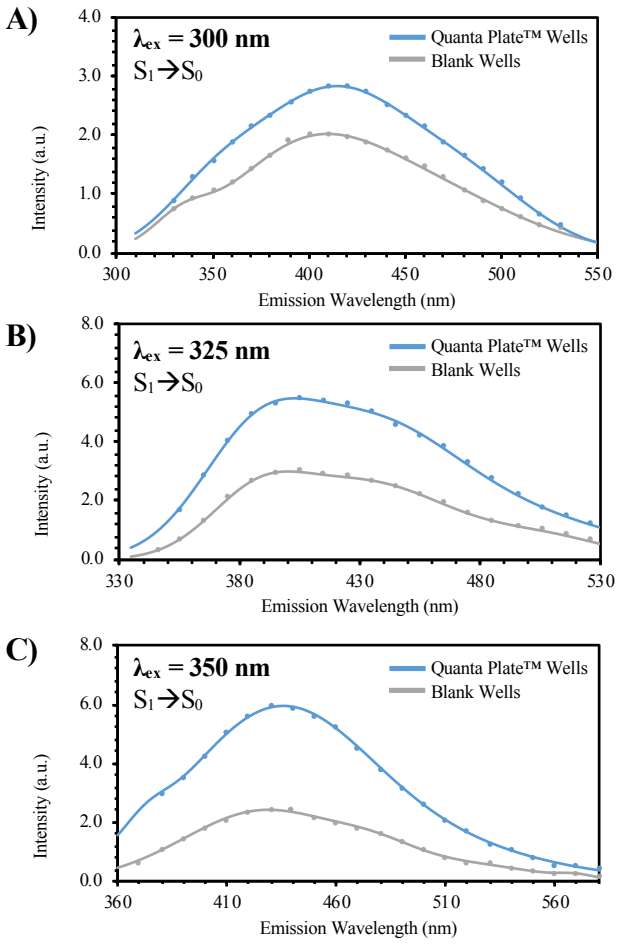

Figure S4. Smoothed curves of normalized enhanced fluorescence (MEF) emission from water dots in glycerol in silver Quanta Plate™ wells, at room temperature and excited at wavelengths of *A)* 300 nm (integration range: 420-550 nm), *B)* 325 nm (integration range: 415-550 nm), *C)* 350 nm (integration range: 445-600 nm).

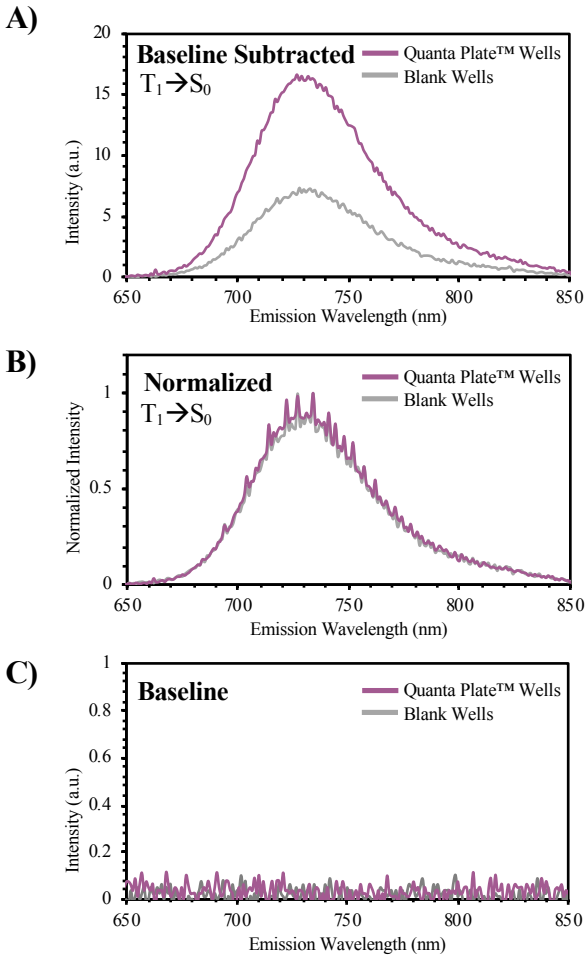

Figure S5. Enhancement of phosphorescent signal (MEP) from Rose Bengal in glycerol in silver Quanta Plate™ wells. λ_{ex} = 532 nm, Temperature at 0 through -10 °C. *A)* Baseline subtracted phosphorescent emission (integration range: 650-850 nm). *B)* Normalized phosphorescence. *C)* Baseline of glycerol solution in blank and Quanta Plate™ wells.

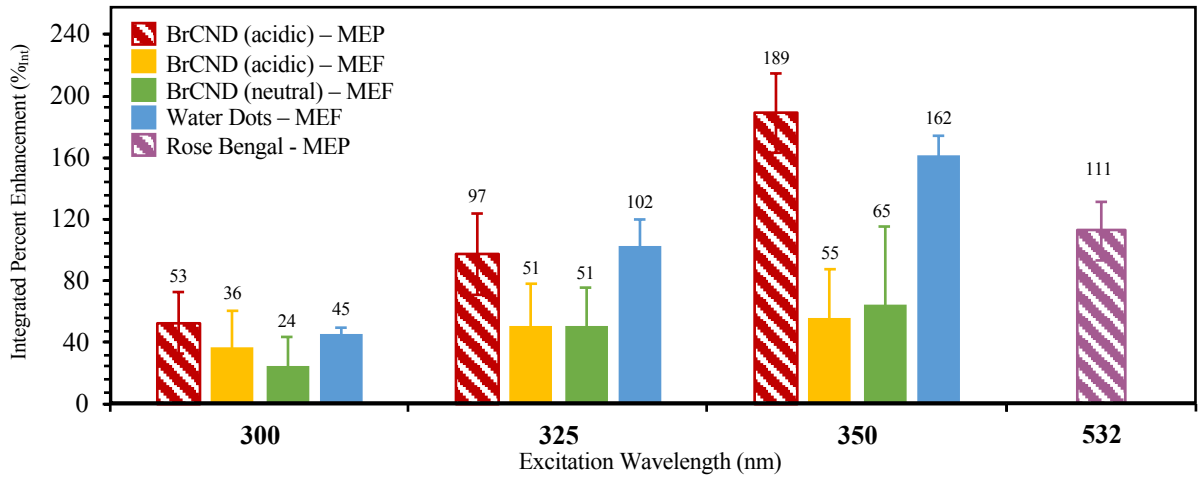

Figure S6. Summary of all calculated signal changes (Integrated % Enhancement) for brominated carbon nanodots, water dots, and Rose Bengal (solvent = glycerol). Values were calculated from integrated signal intensities over the emission ranges indicated in this publication. (MEF: Metal-Enhanced Fluorescence, MEP: Metal-Enhanced Phosphorescence, BrCND: brominated carbon nanodots)

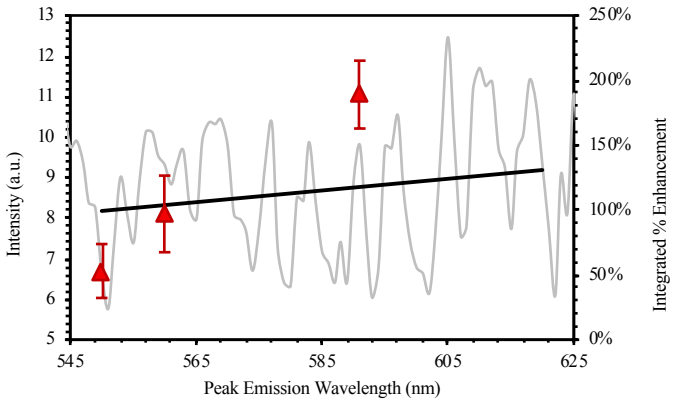

Figure S7. Close up of Metal-Enhanced Phosphorescence integrated percent enhancements (red triangles, plotted against peak emission wavelengths) from acidic brominated carbon nanodots overlaid with synchronous scattering spectrum of silver wells (grey). Black line indicates overall positive change in scattering intensity from the wells over this wavelength range.

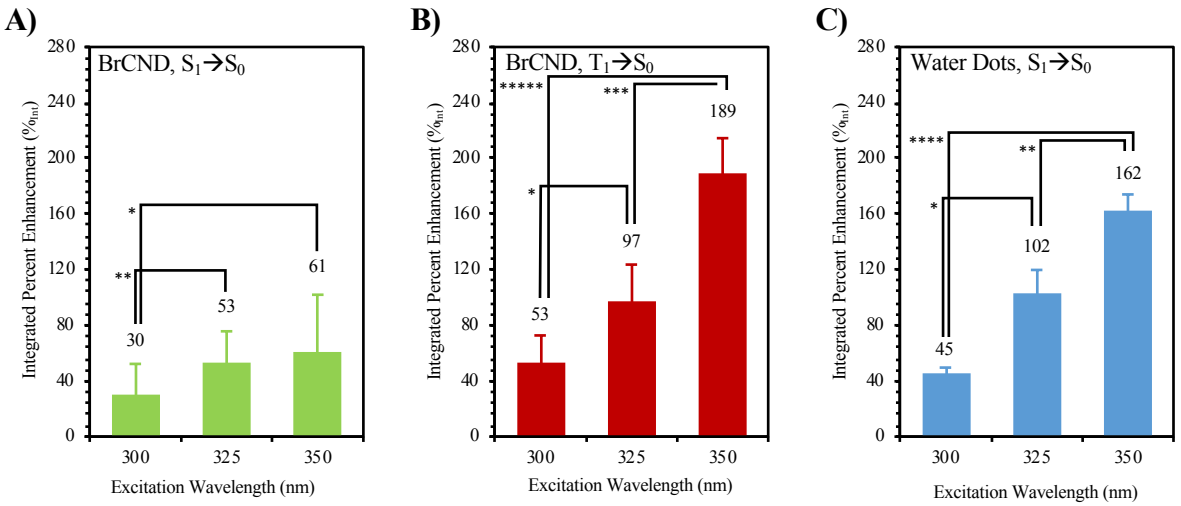

Figure S8. Statistical significance analysis from 2-tailed t-test between excitation wavelengths for *A)* BrCND averages (S_1, MEF), *B)* acidic BrCND (T_1, MEP), and *C)* water dots (S_1, MEF). No statistical difference was found between BrCND fluorescence enhancement (neutral vs acidic), so all sample values were averaged. (MEF: metal enhanced fluorescence, MEP: metal enhanced phosphorescence, BrCND: brominated carbon nanodots // * $p < 0.05$, ** $p < 0.02$, *** $p < 0.01$, **** $p < 0.002$, ***** $p < 0.001$)

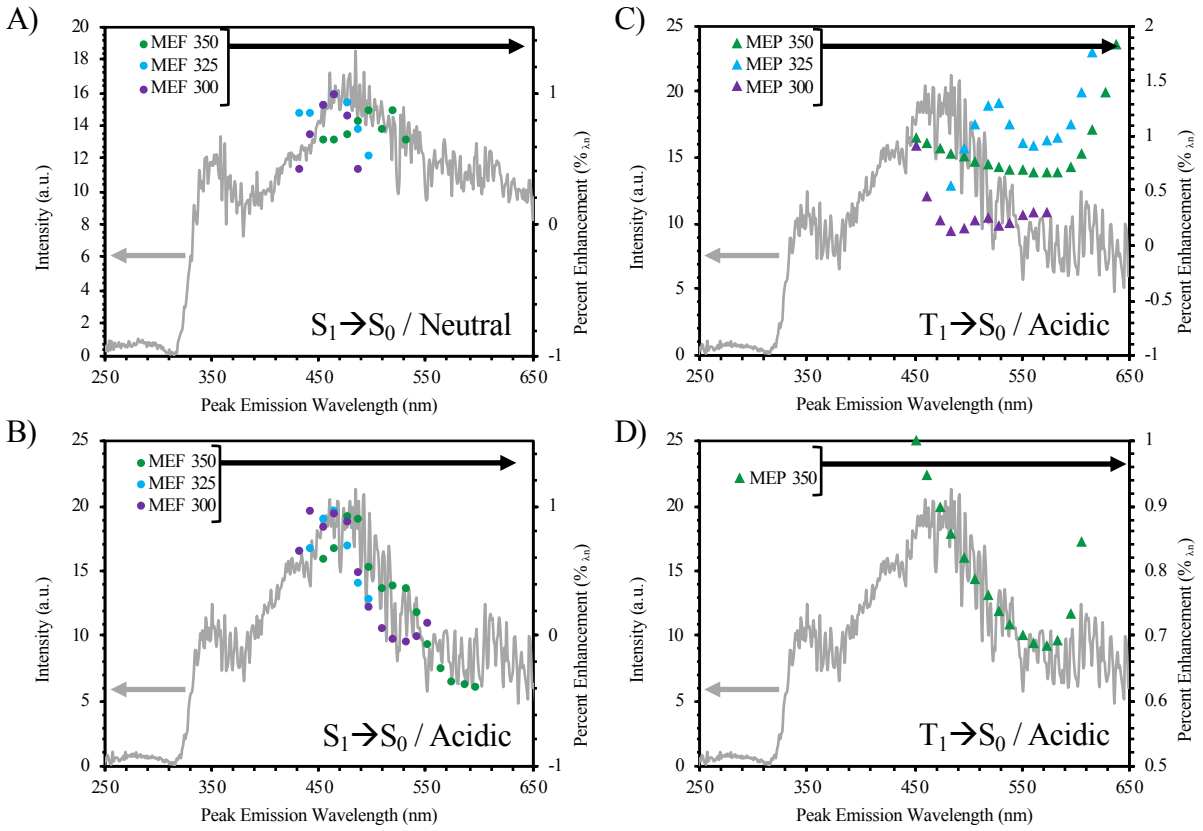

Figure S9. Emission wavelength dependence of percent enhancements ($\%_{\lambda n}$) for bromine dots at excitation wavelengths of 300, 325, and 350 nm plotted against the synchronous scattering spectra for the Quanta Plate™ wells. *A)* Metal-Enhanced Fluorescence under neutral conditions. *B)* Metal-Enhanced Fluorescence under acidic conditions. *C)* Metal-Enhanced Phosphorescence under acidic conditions. *D)* Adjusted scale from (C) for excitation at 350 nm. Percent enhancements were calculated from fitted data.

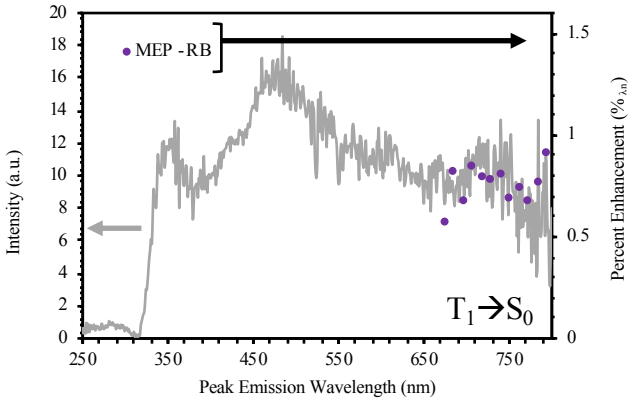

Figure S10. Emission wavelength dependence of percent enhancements ($\%_{\lambda n}$) for Rose Bengal excited at 532 nm, plotted against the synchronous scattering spectrum for a water/glycerol solution in the Quanta Plate™ Wells. Percent enhancements were calculated from fitted data.

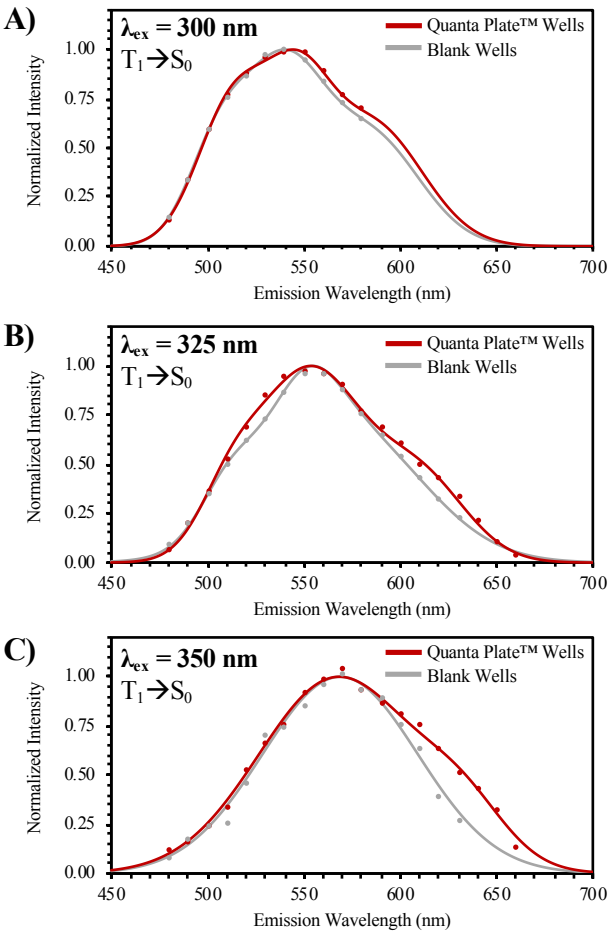

Figure S11. Normalized fits (solid line) and smoothed raw data (dots) of enhanced phosphorescence (MEP) emission from brominated carbon nanodots under acidic conditions, mixed in glycerol, in silver Quanta Plate™ wells. Temperature at 0 to -10 °C, excited at wavelengths of *A)* 300 nm (integration range: 450-580 nm), *B)* 325 nm (integration range: 450-630 nm), *C)* 350 nm (integration range: 450-650 nm).