

## Supporting Information (SI) Section

# Effect of Photolysis on Absorption and Fluorescence Spectra of Light-Absorbing Secondary Organic Aerosols

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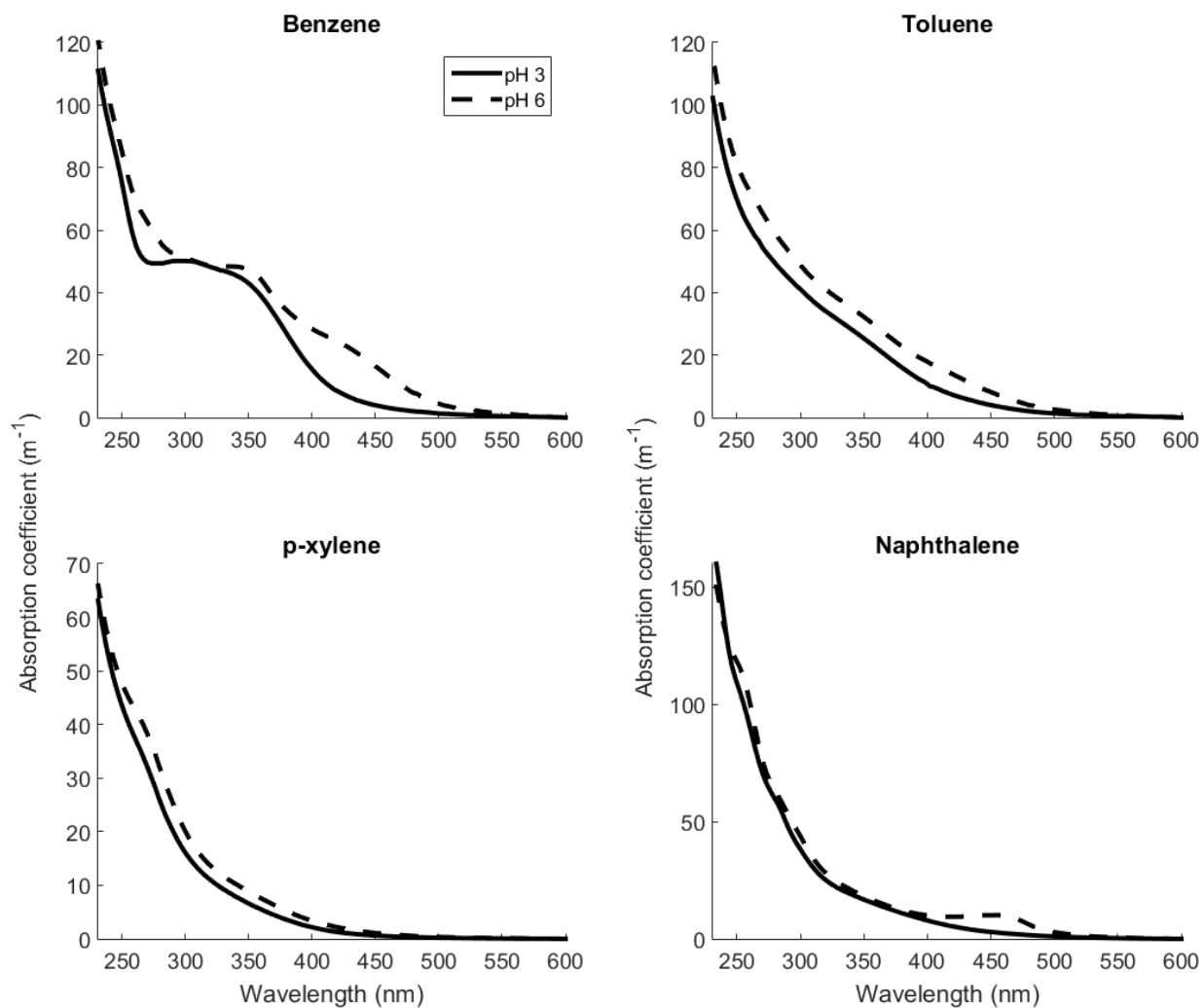
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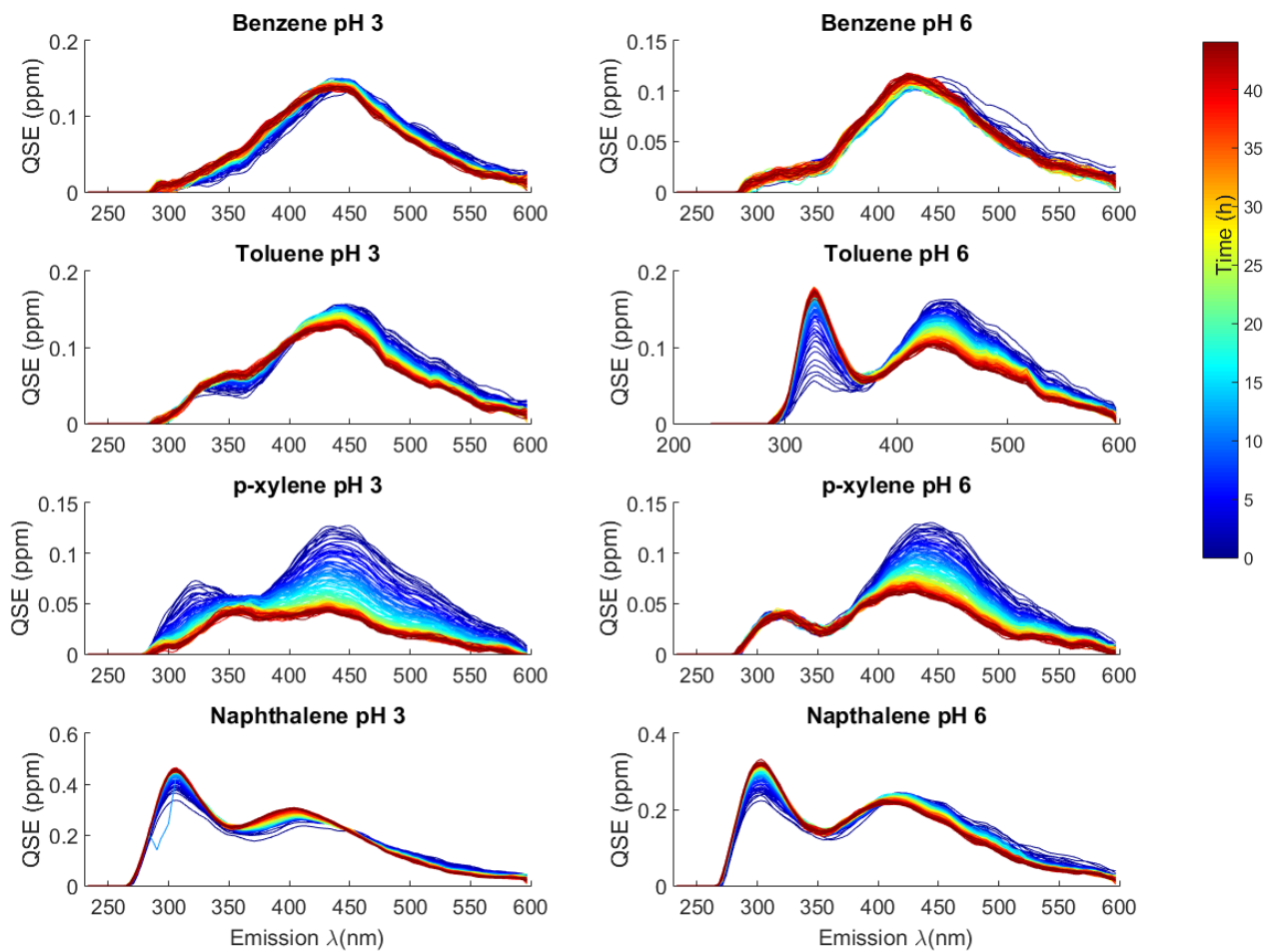
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**Figure S1: Comparison of solution absorption coefficients at t=0**

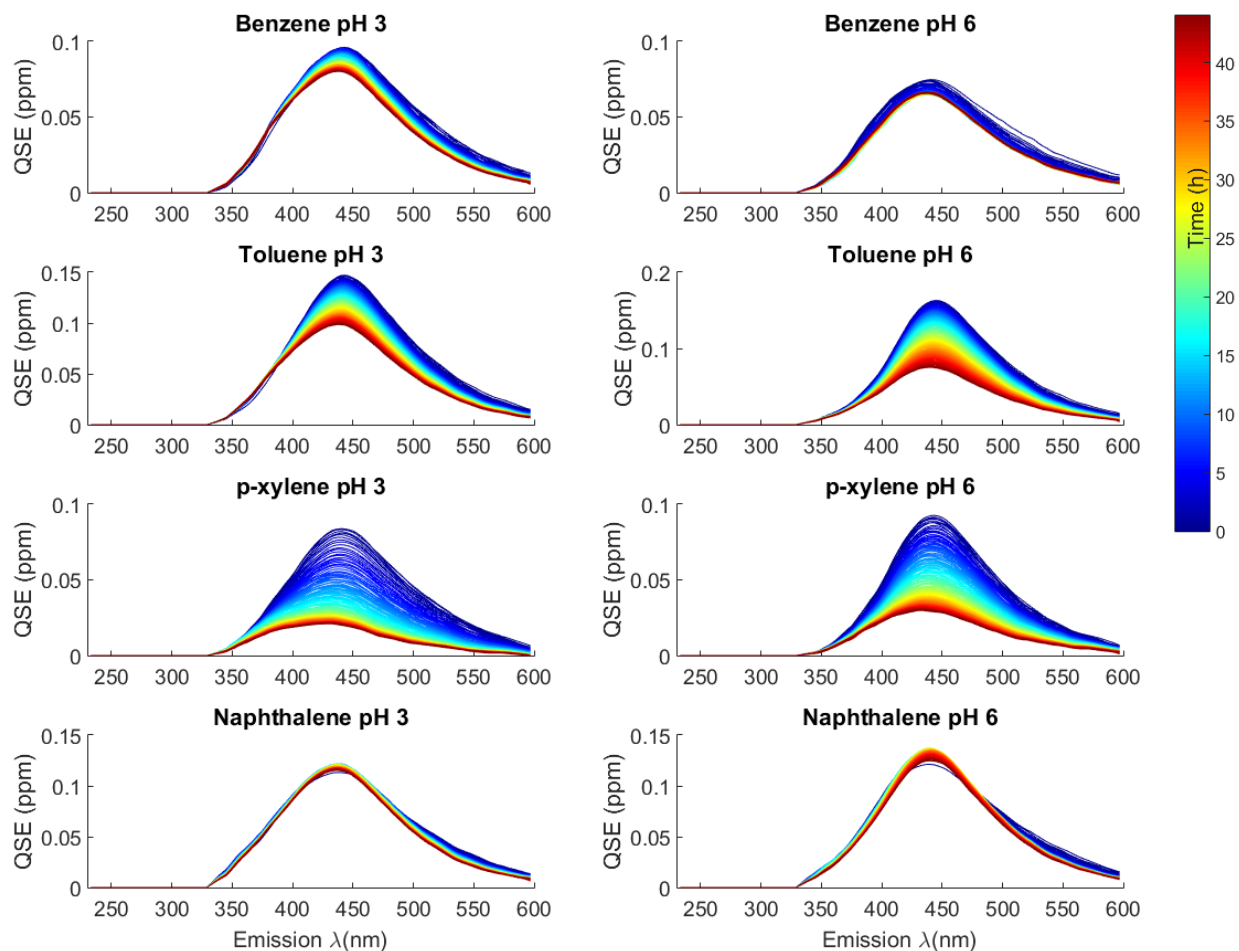
Plots shown for all four SOA types and two different pH values (pH 3 is a solid line and pH 6 is a dotted line). If desired, these solution absorption coefficients can be converted into bulk mass absorption coefficients (MAC) of the SOA material using equation (2) in the main text. For example, the solution absorption coefficient for NAP SOA at 300 nm is about  $40 \text{ m}^{-1}$ . The mass concentration of NAP SOA in the solution is about  $40 \text{ mg/L} = 40 \text{ g/m}^3$  (Table 1). This gives:

$$MAC_{bulk} = \frac{\alpha_{solution}}{C_{mass}} \sim \frac{40 \text{ m}^{-1}}{40 \text{ g} \cdot \text{m}^{-3}} = 1 \frac{\text{m}^2}{\text{g}}$$



**Figure S2: Fluorescence spectra at  $\lambda_{\text{ex}} = 250 \text{ nm}$**

Plots shown for each SOA sample at pH 3 (left) and pH 6 (right). The excitation wavelength chosen for this plot ( $\lambda_{\text{ex}} = 330 \text{ nm}$ ) corresponds to one of the observed maxima in the EEM spectra (Figures 5,6,7,8).



**Figure S3: Fluorescence spectra at  $\lambda_{ex} = 330$  nm**

Plots shown for each SOA sample at pH 3 (left) and pH 6 (right). The excitation wavelength chosen for this plot ( $\lambda_{ex} = 330$  nm) corresponds to one of the observed maxima in the EEM spectra (Figures 5,6,7,8).