

# Supplement

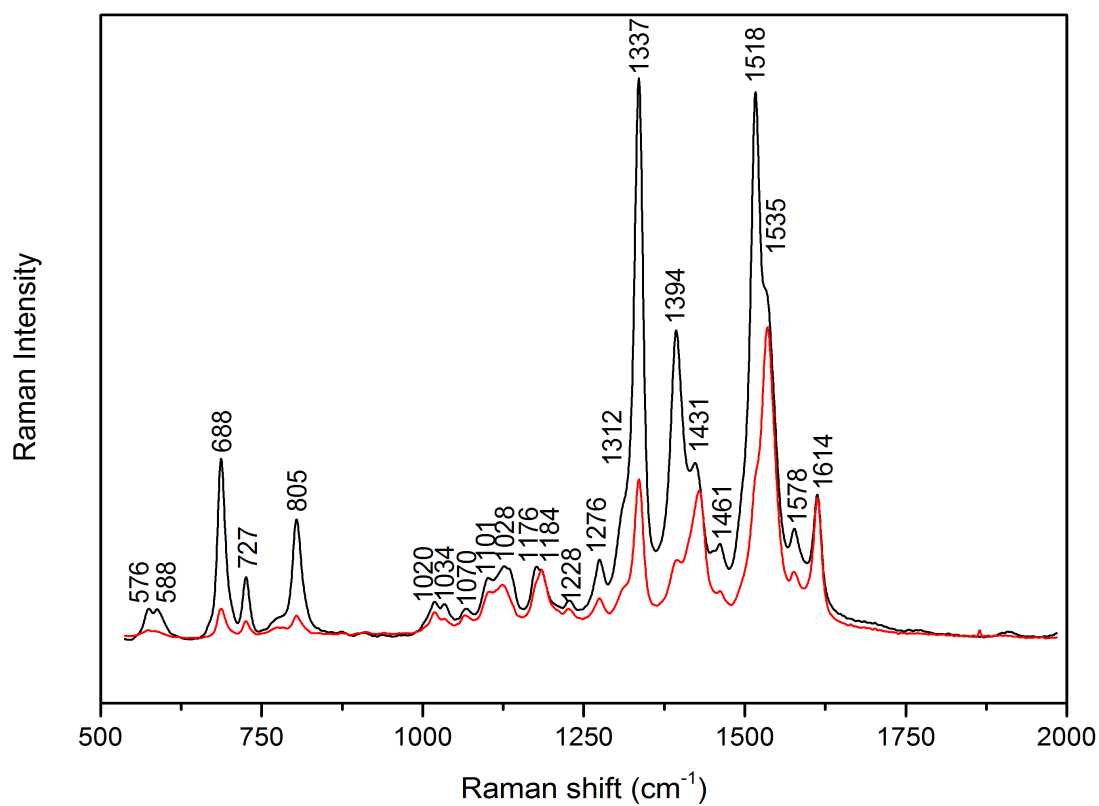


Figure S1: Raman spectra of  $1.0 \cdot 10^{-2}$  M  $H_2PcTS$  in water at 514.5 nm excitation with parallel (black) and perpendicular (red) polarization with respect to the incident radiation. (baseline corrected)

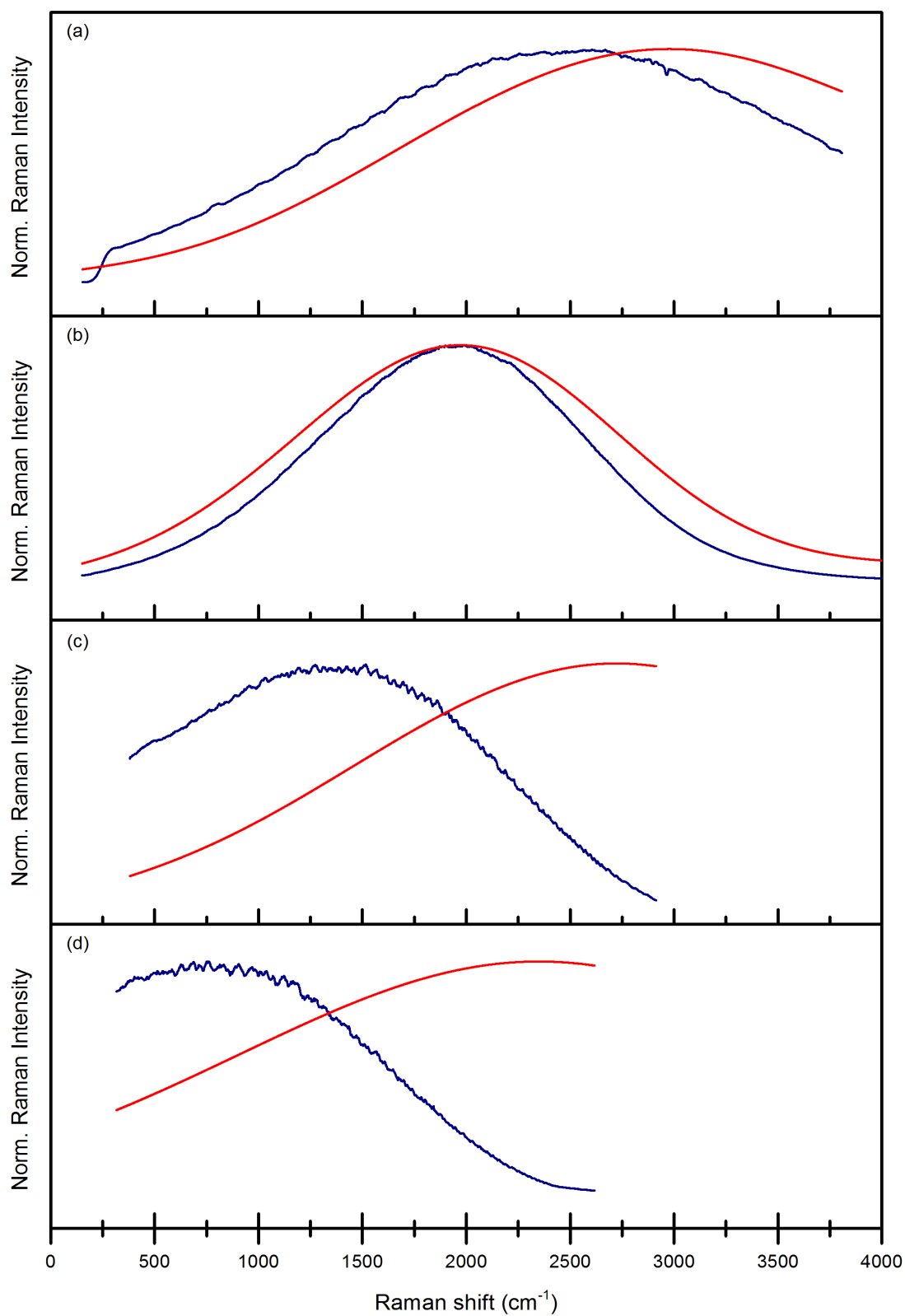


Figure S2: Acquired (blue) and theoretical (red) emission spectra of available certified fluorescence standards for four excitation wavelengths. Spectra are normalized to unity at their respective maxima. (a) 532, (b) 633, (c) 785 and (d) 830 nm.

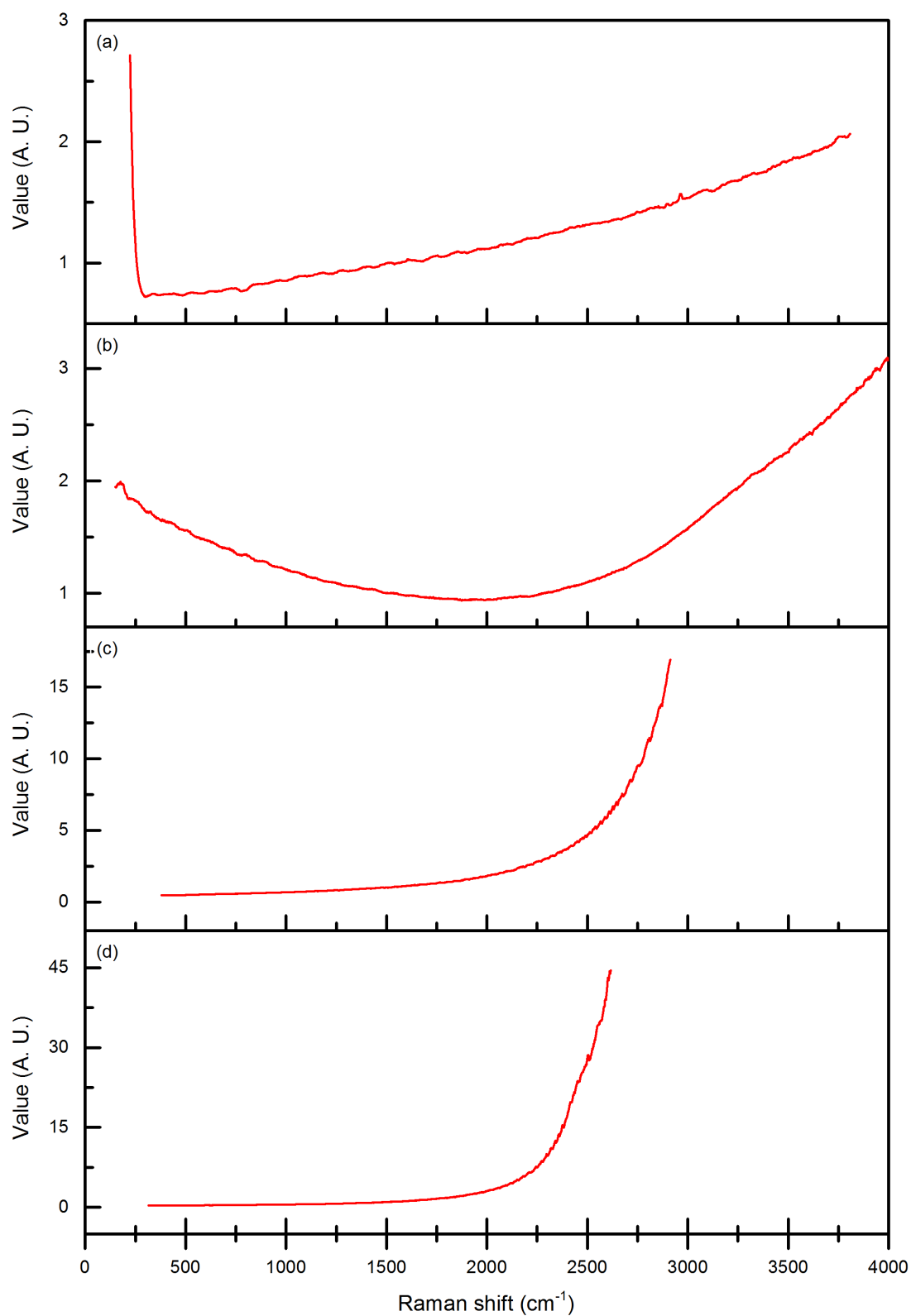


Figure S3: Intensity correction functions based on the available certified fluorescence standards. Functions are normalized to unity at 1500 cm<sup>-1</sup>. (a) 532, (b) 633, (c) 785 and (d) 830 nm.

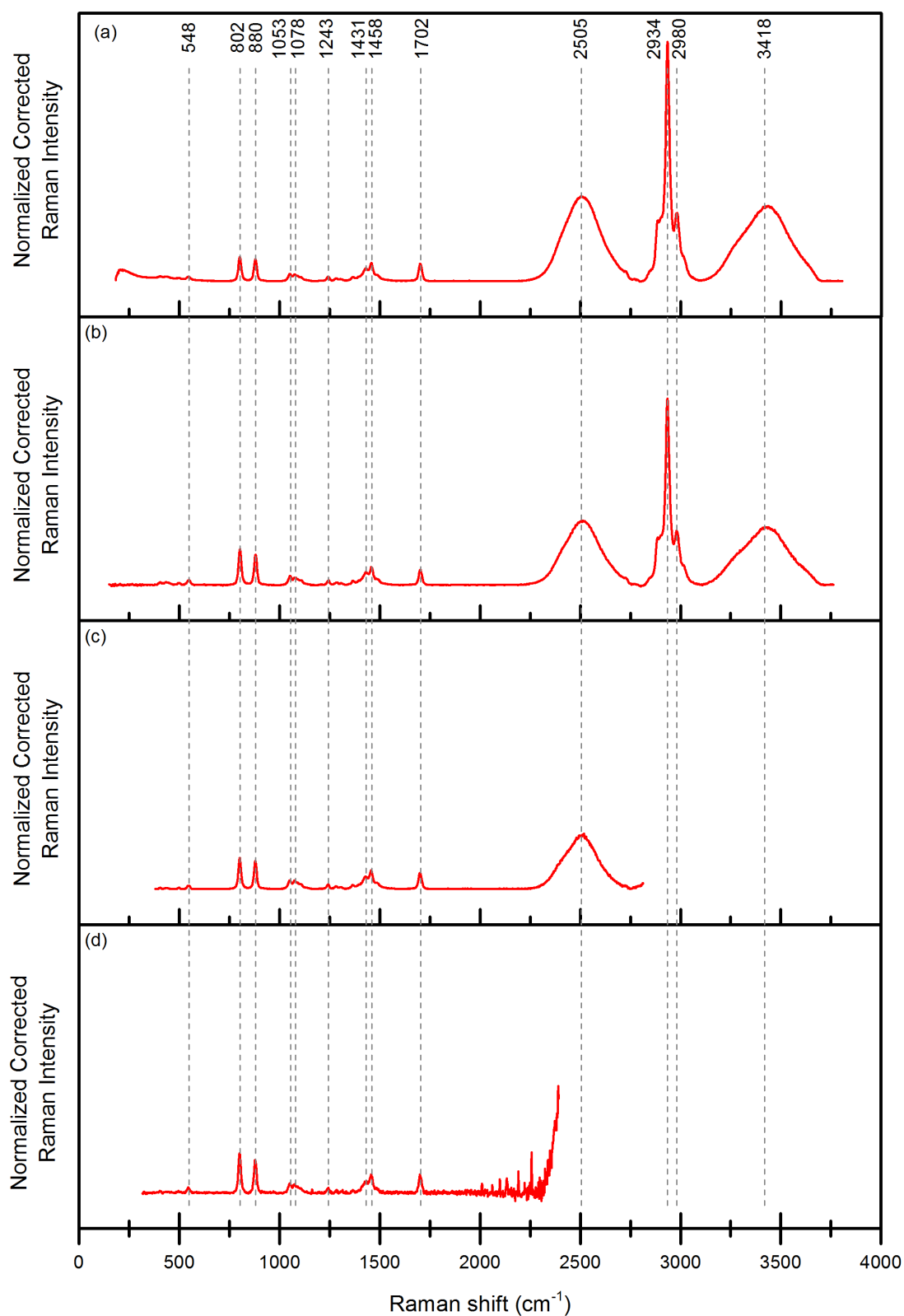


Figure S4: Raman spectra of the calibration mixture after correction based on the certified standards. Normalized to unity at 1458  $\text{cm}^{-1}$ . (a) 532, (b) 633, (c) 785 and (d) 830 nm. (baseline corrected)

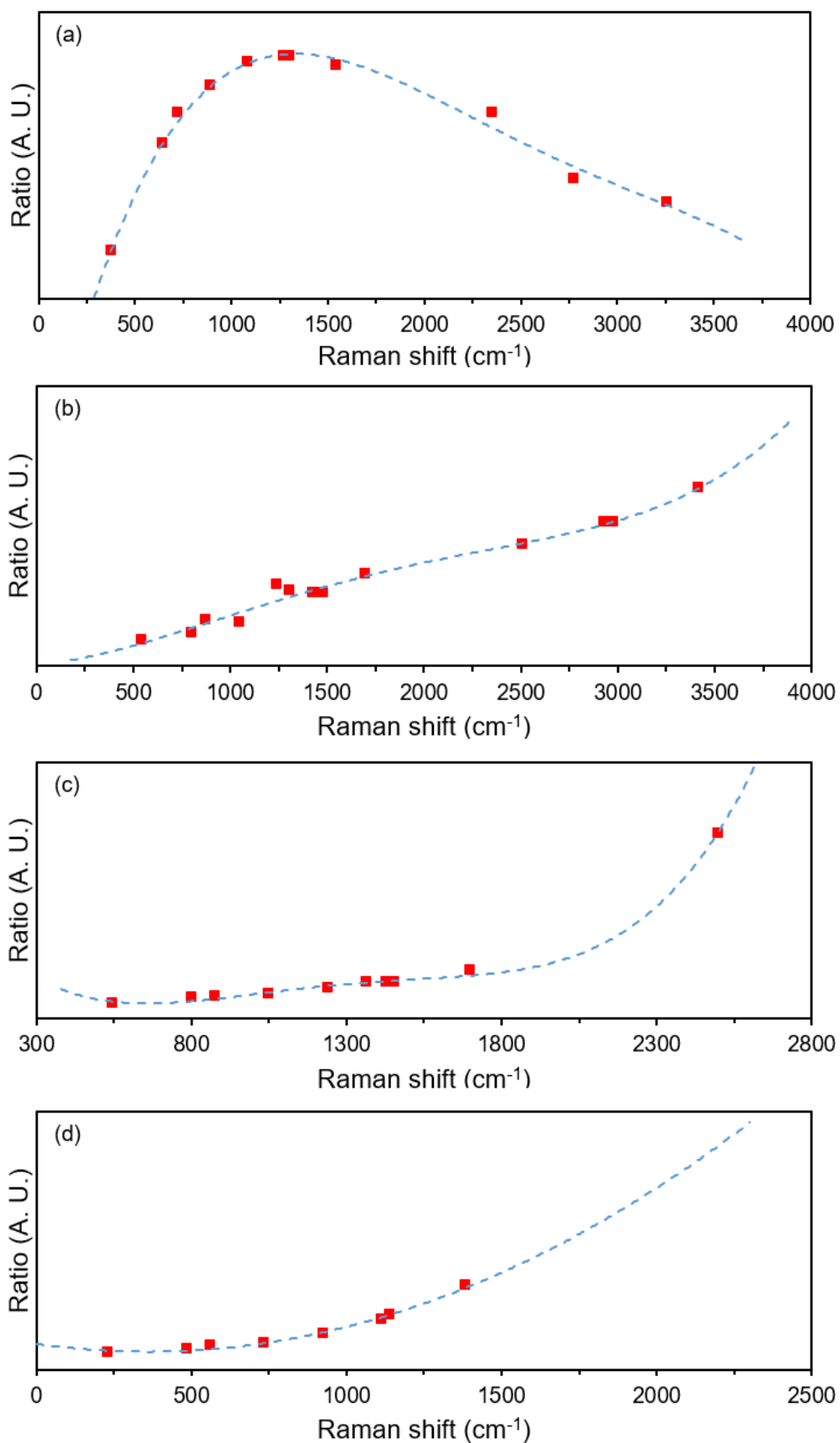


Figure S5: Selected points and their intensity ratios to those at 633 nm excitation and the fitting functions. (a) 532, (b) 647, (c) 785 and (d) 830 nm.

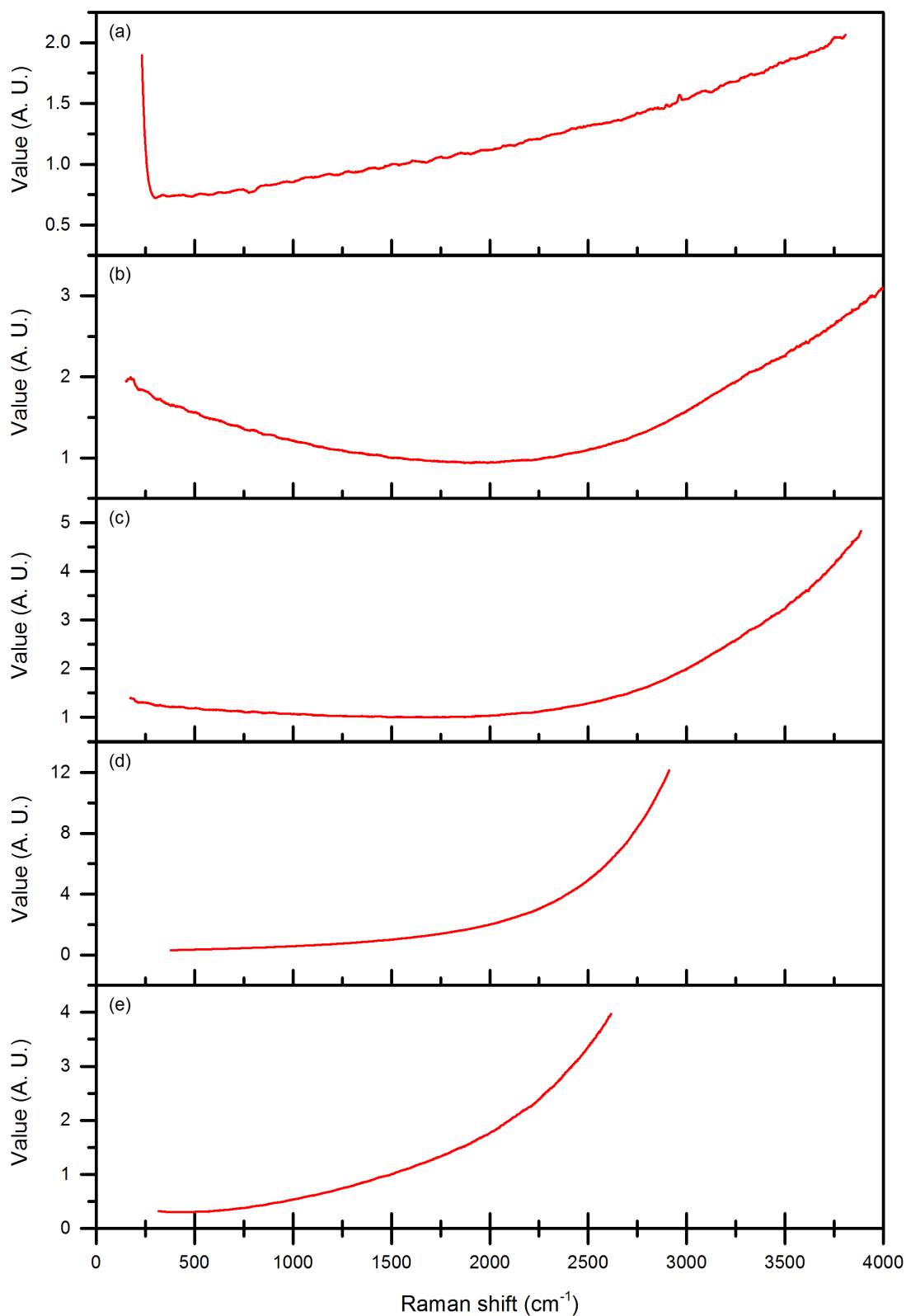


Figure S6: Final intensity correction functions for individual excitation wavelengths: (a) 532, (b) 633, (c) 647, (d) 785 and (e) 830 nm. These correction functions were applied to all discussed spectra acquired at WITec alpha300. Functions are normalized to unity at 1500 cm<sup>-1</sup>.

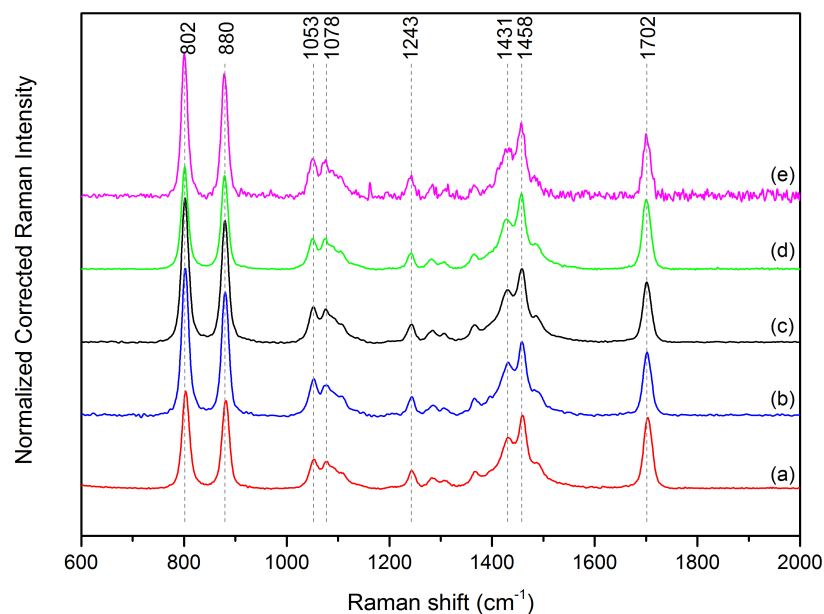


Figure S7: Raman spectra of the calibration mixture after final employed intensity correction, spectral region  $600 - 2000 \text{ cm}^{-1}$  in detail. Normalized to unity at  $1458 \text{ cm}^{-1}$  and baseline corrected. (a) 532, (b) 633, (c) 647, (d) 785 and (e) 830 nm. Although the intensity of the lower wavenumber bands in spectra at 532 and 785 nm reaches slightly lower values than for the other three excitation wavelengths, the correction functions overall balance very well the plummeting CCD detector response.

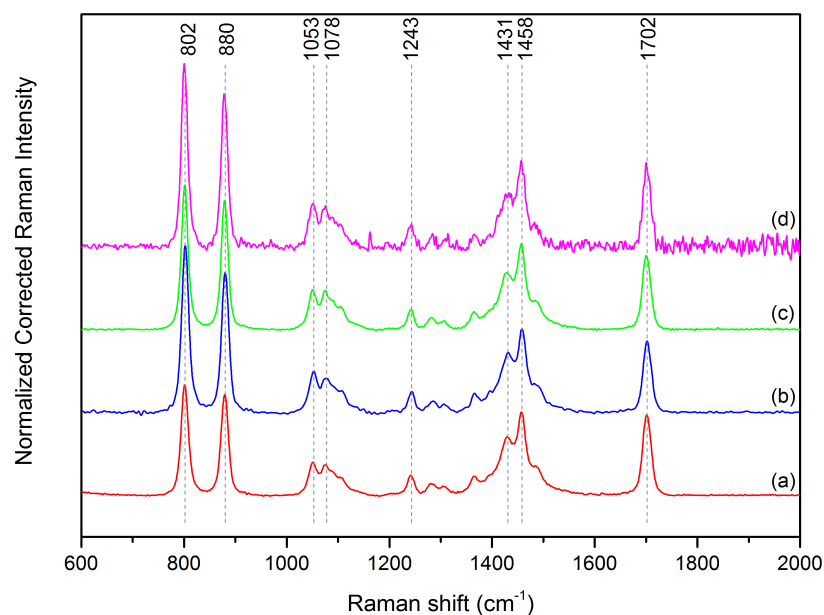


Figure S8: Raman spectra of the calibration mixture after intensity correction based on the certified standards, spectral region  $600 - 2000 \text{ cm}^{-1}$  in detail. Normalized to unity at  $1458 \text{ cm}^{-1}$  and baseline corrected. (a) 532, (b) 633, (c) 785 and (d) 830 nm. While the spectra for higher excitation wavelengths match each other well, the correction for 532 nm excitation appears to slightly differ at lower wavenumbers, and further investigation is in place to resolve this minor discrepancy. Nevertheless, the correction functions overall compensate very well for the decreasing CCD detector response.

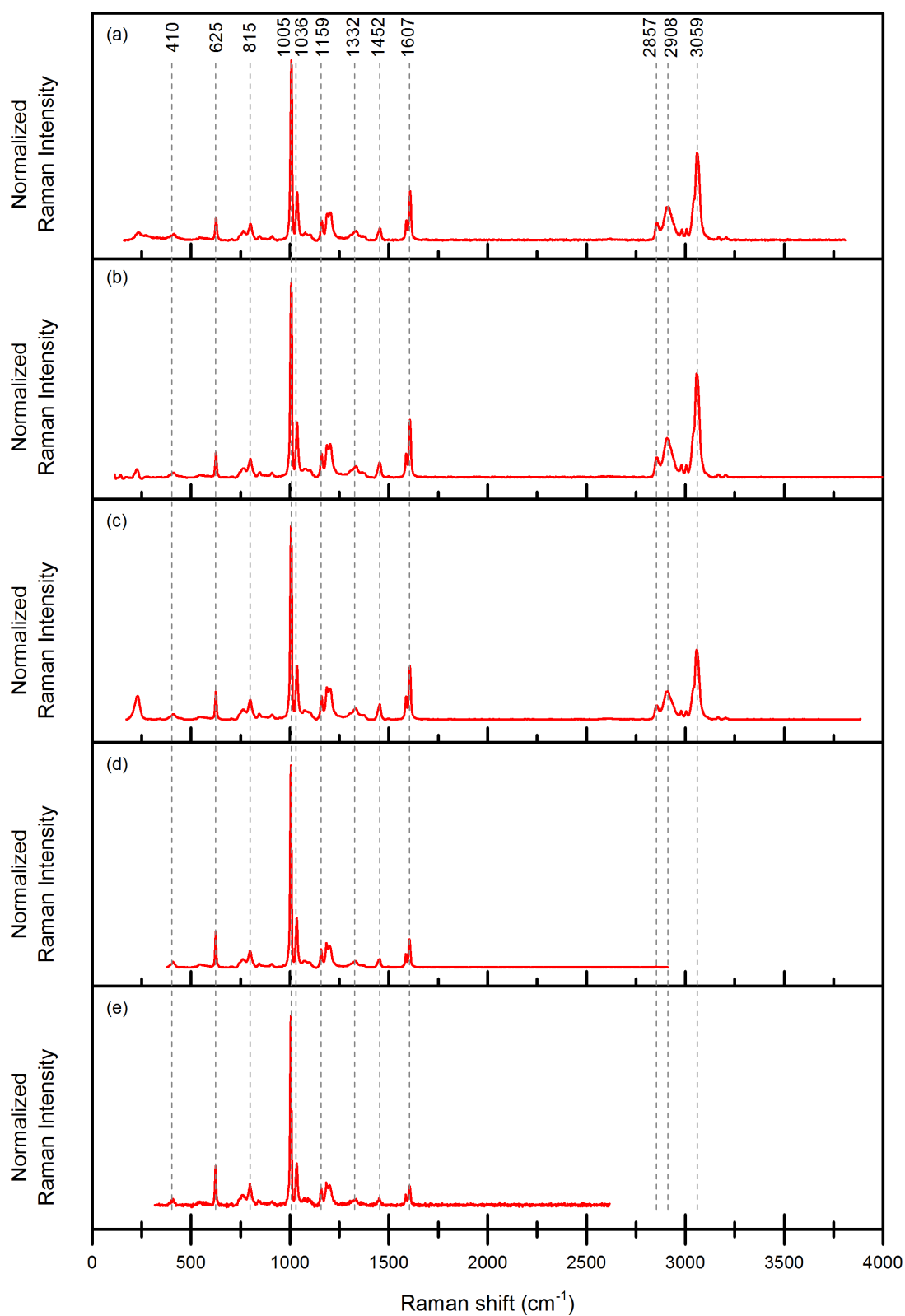


Figure S9: Raman spectra of polystyrene at five excitation wavelengths prior to intensity correction. Spectra are normalized to their respective maxima. (a) 532, (b) 633, (c) 647, (d) 785 and (e) 830 nm.



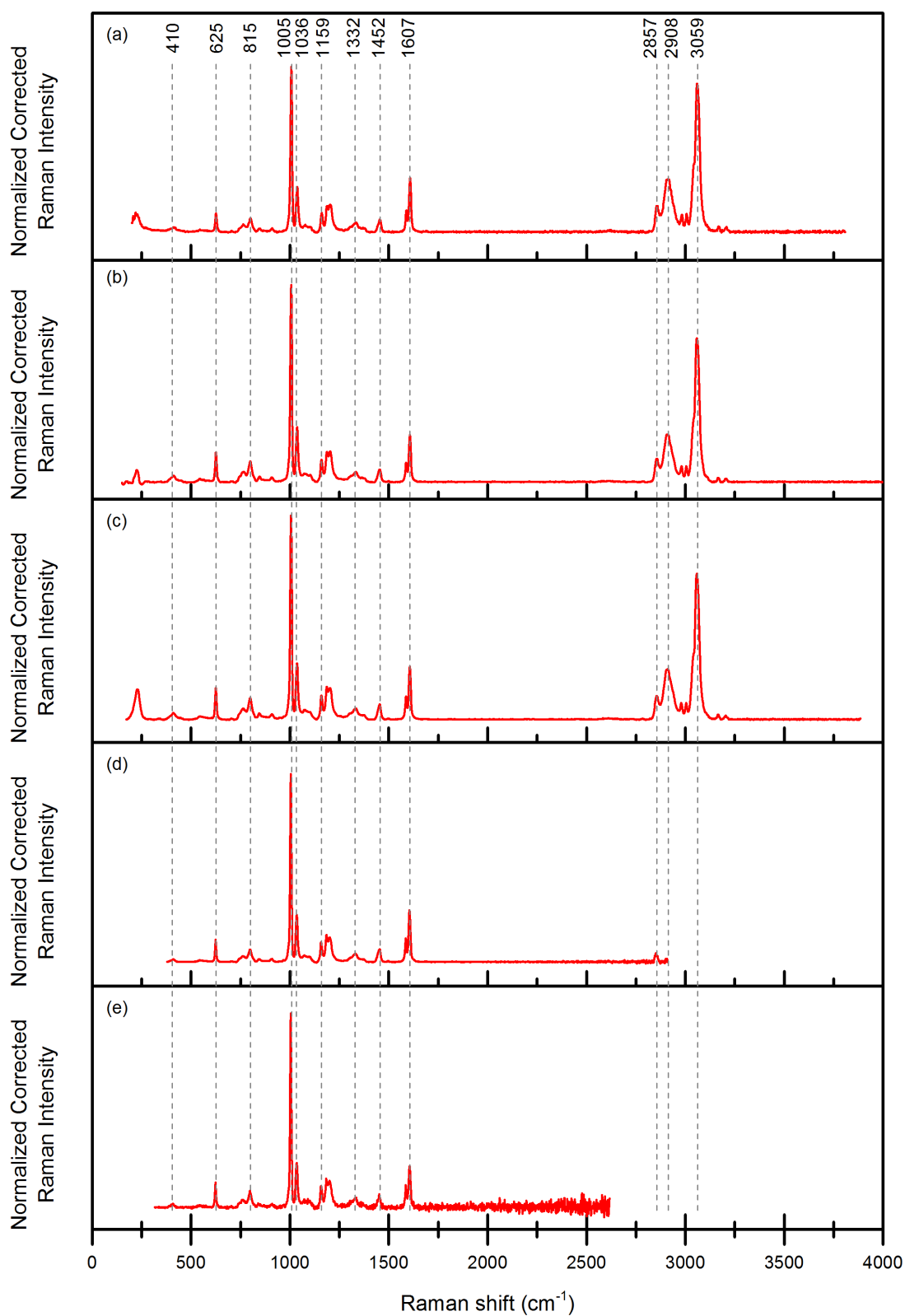


Figure S10: Raman spectra of polystyrene at five excitation wavelengths after intensity correction. Spectra are normalized to their respective maxima. (a) 532, (b) 633, (c) 647, (d) 785 and (e) 830 nm.

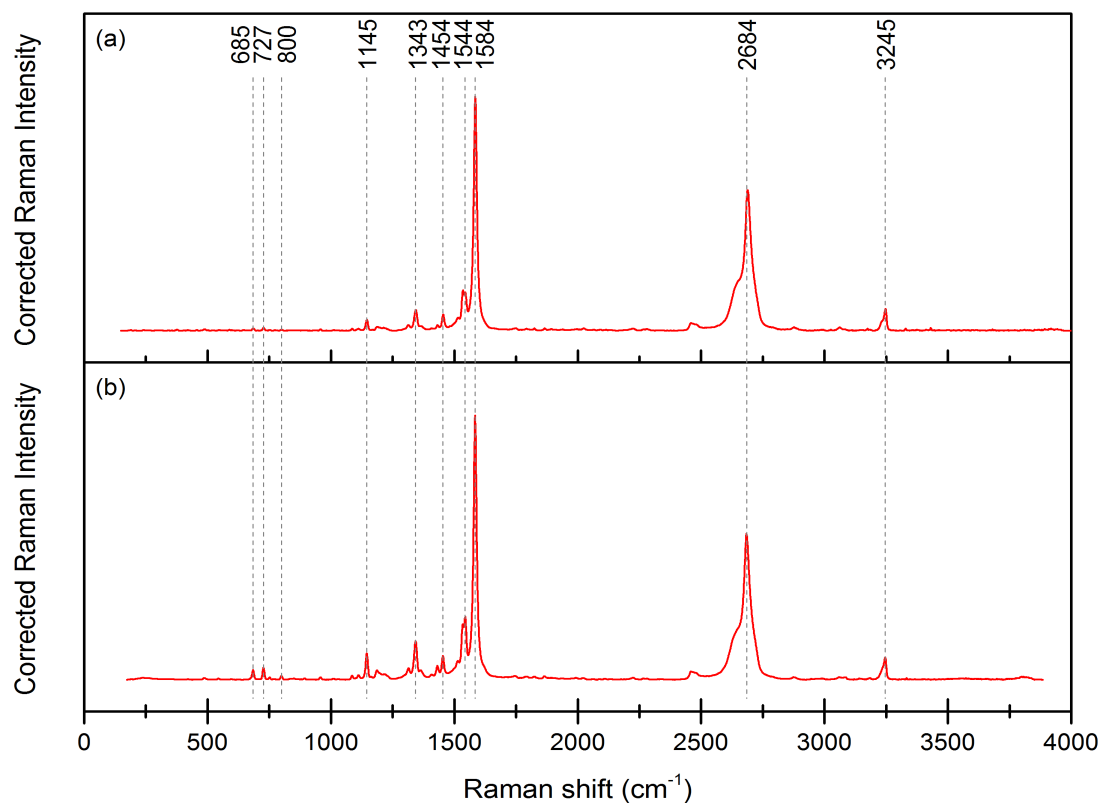


Figure S11: Raman spectra of HOPG/H<sub>2</sub>Pc-VI system at excitation wavelengths (a) 633 and (b) 647 nm.

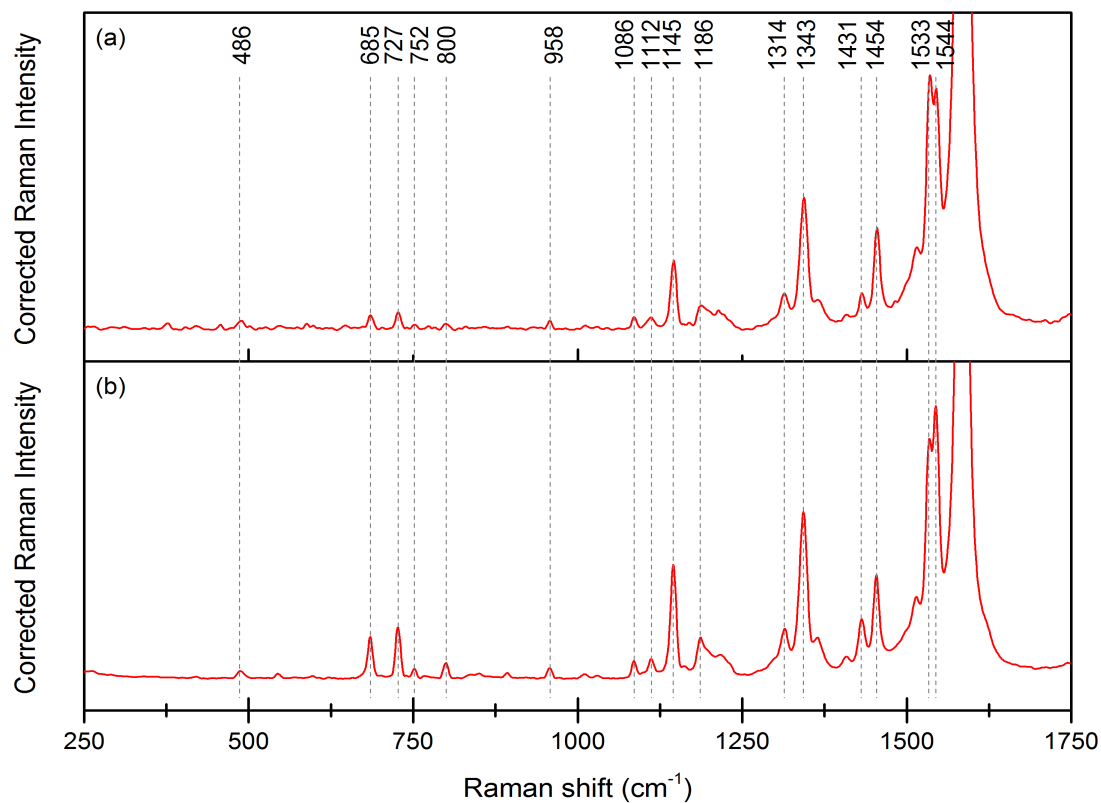


Figure S12: Enlarged region of Raman spectra of HOPG/H<sub>2</sub>Pc-VI system at excitation wavelengths (a) 633 and (b) 647 nm.