

Supporting Information of

Synthesis of molybdenum nanoclusters from *Vitex negundo* leaves for sensing of epinephrine in pharmaceutical composition

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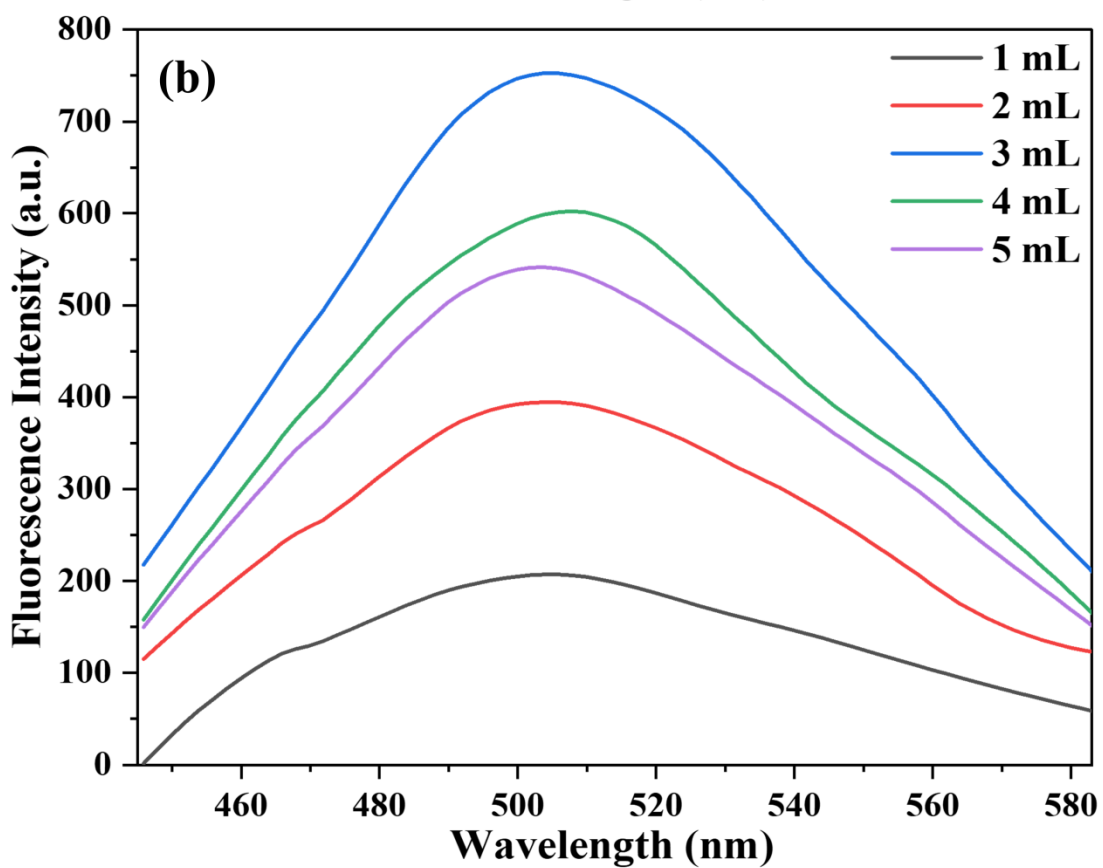
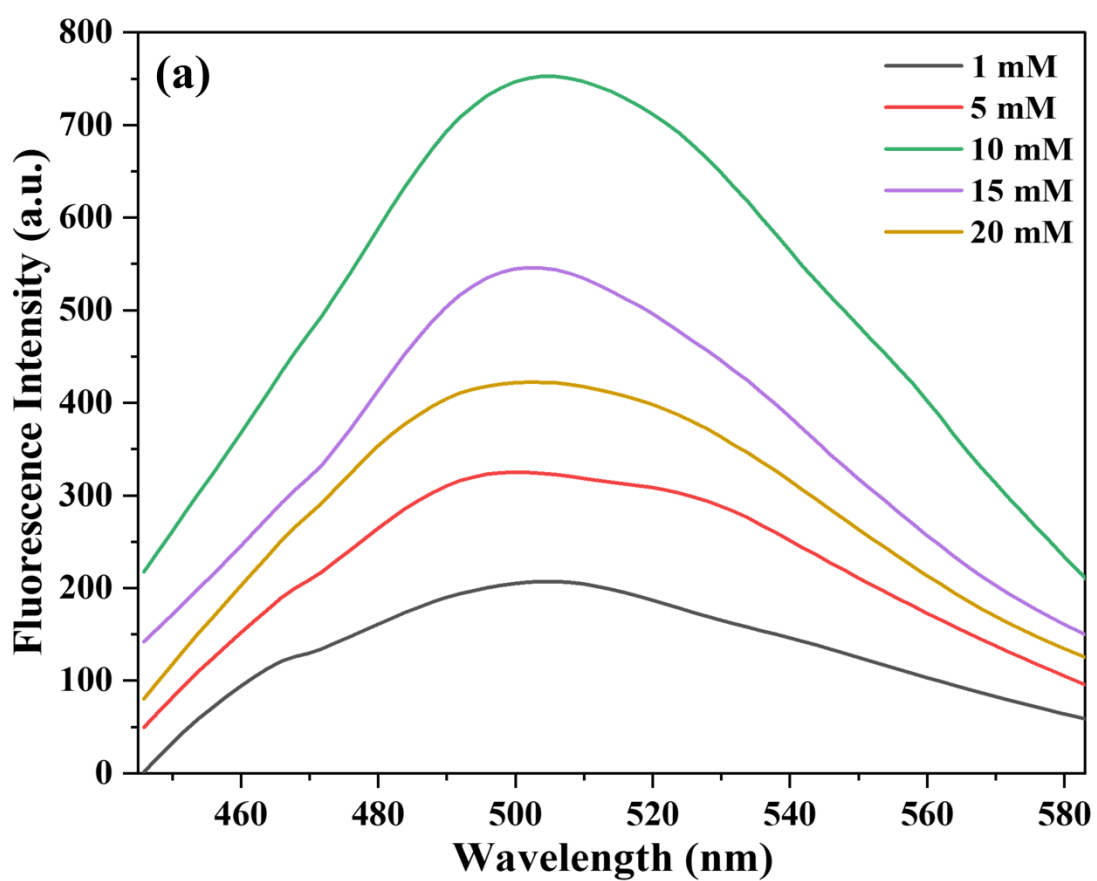


Figure S1. Emission spectra study of *V. negundo*-MoNCs at various (a) concentrations of MoCl₅ (1 mM-20 mM), (b) volumes of *V. negundo* extract from 1 mL to 5 mL.

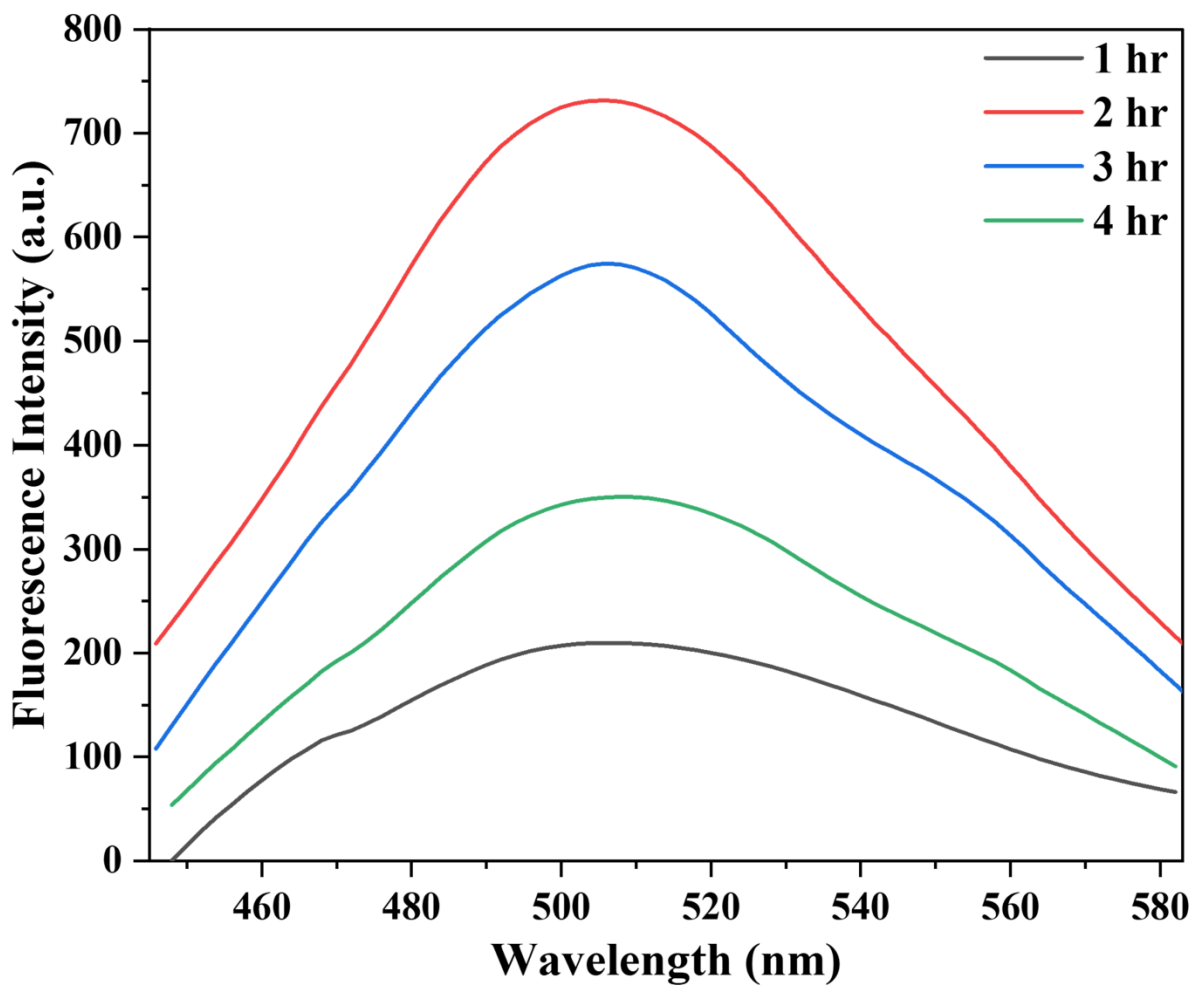


Figure S2. Fluorescence spectra of *V. negundo*-MoNCs at various reaction times (1 hr-4 hr).

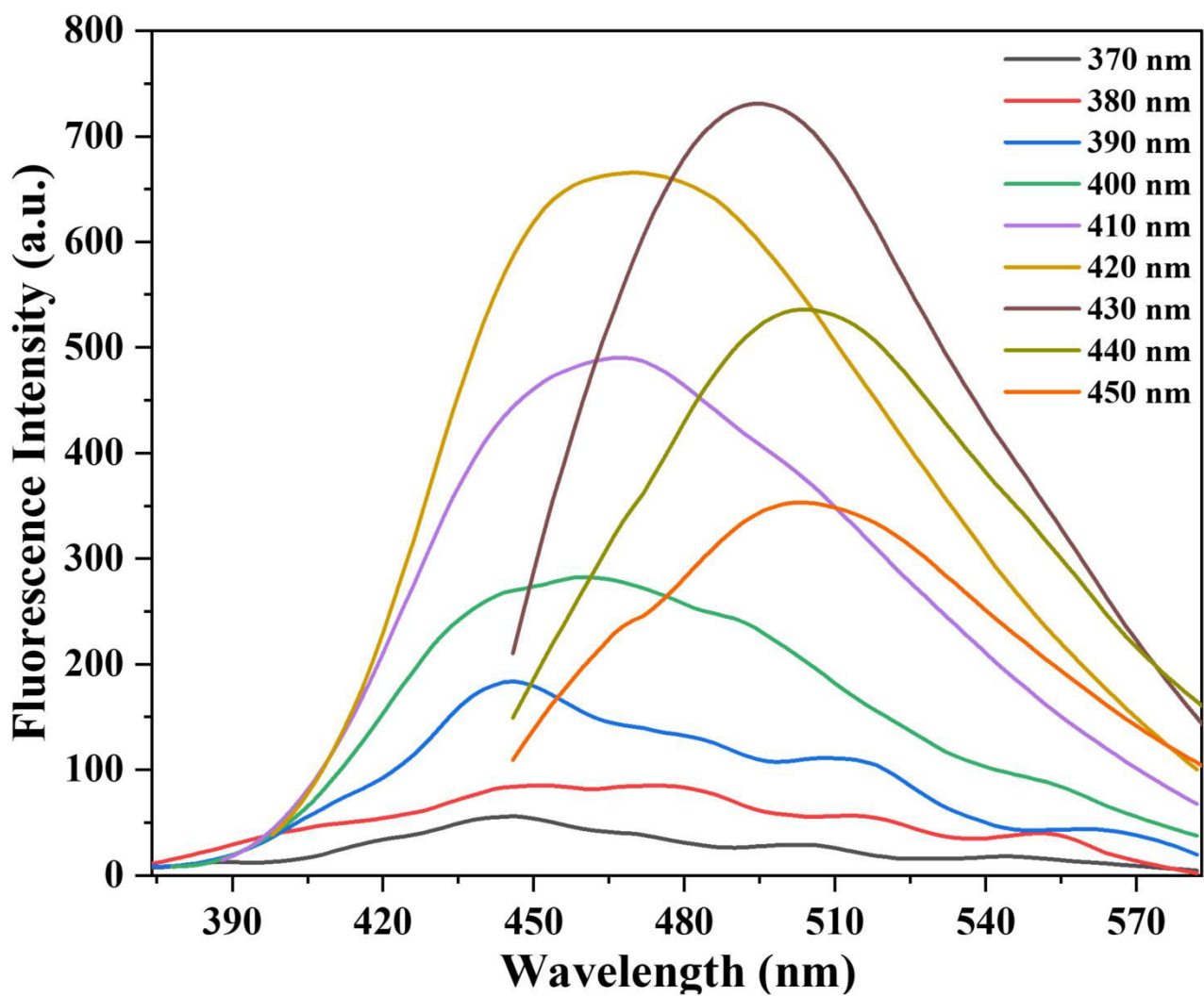


Figure S3. Excitation dependent emission spectra of *V. negundo*-MoNCs at different excitation wavelengths from 370-450 nm.

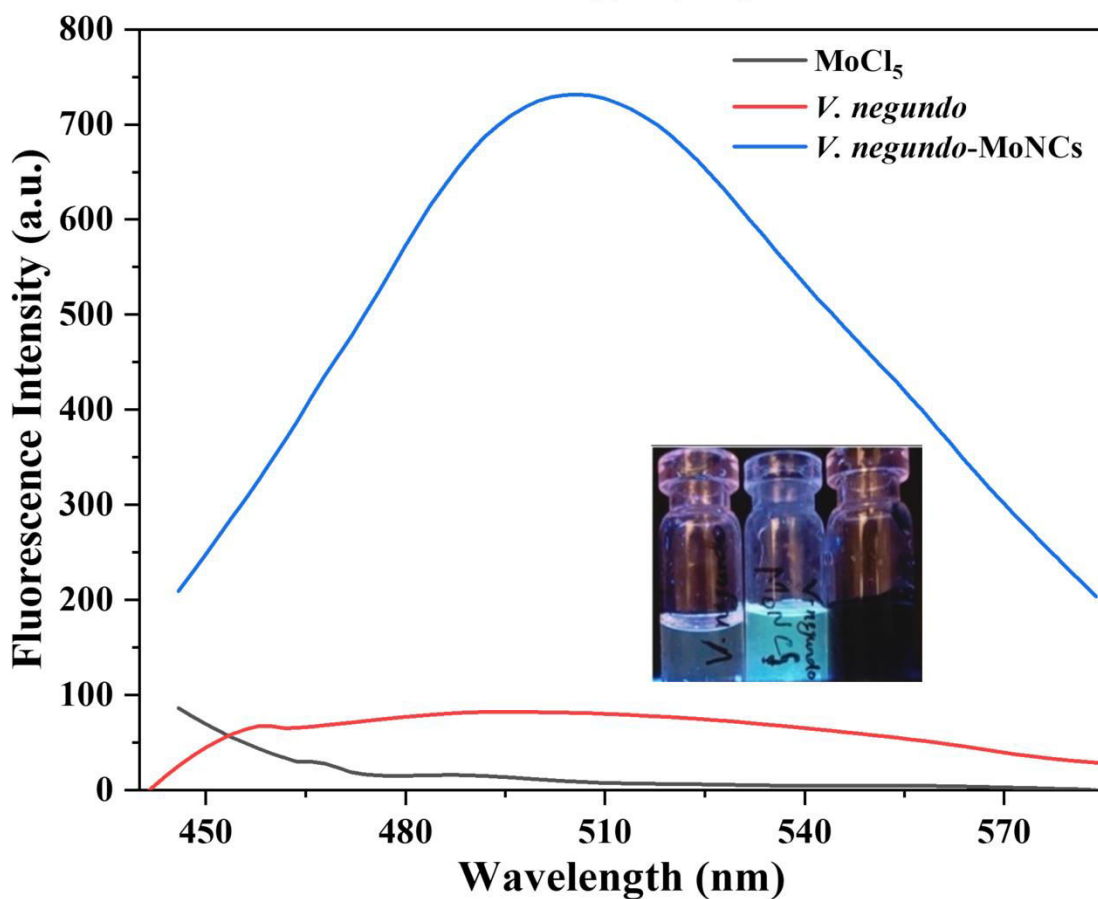
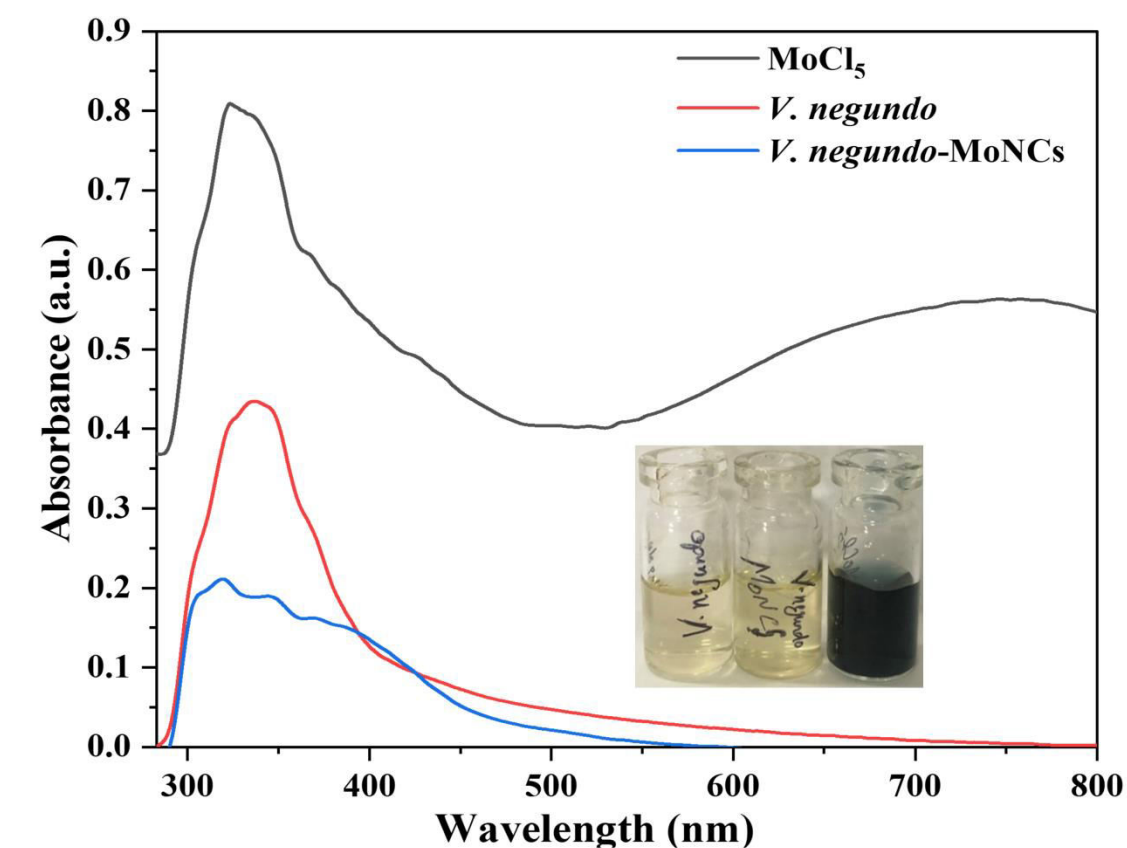


Figure S4. (a) Absorption spectra of MoCl_5 , *V. negundo*, *V. negundo*-MoNCs, (b) Fluorescence emission spectra of MoCl_5 , *V. negundo*, *V. negundo*-MoNCs. Inset: photographic images of corresponding solutions under UV light.

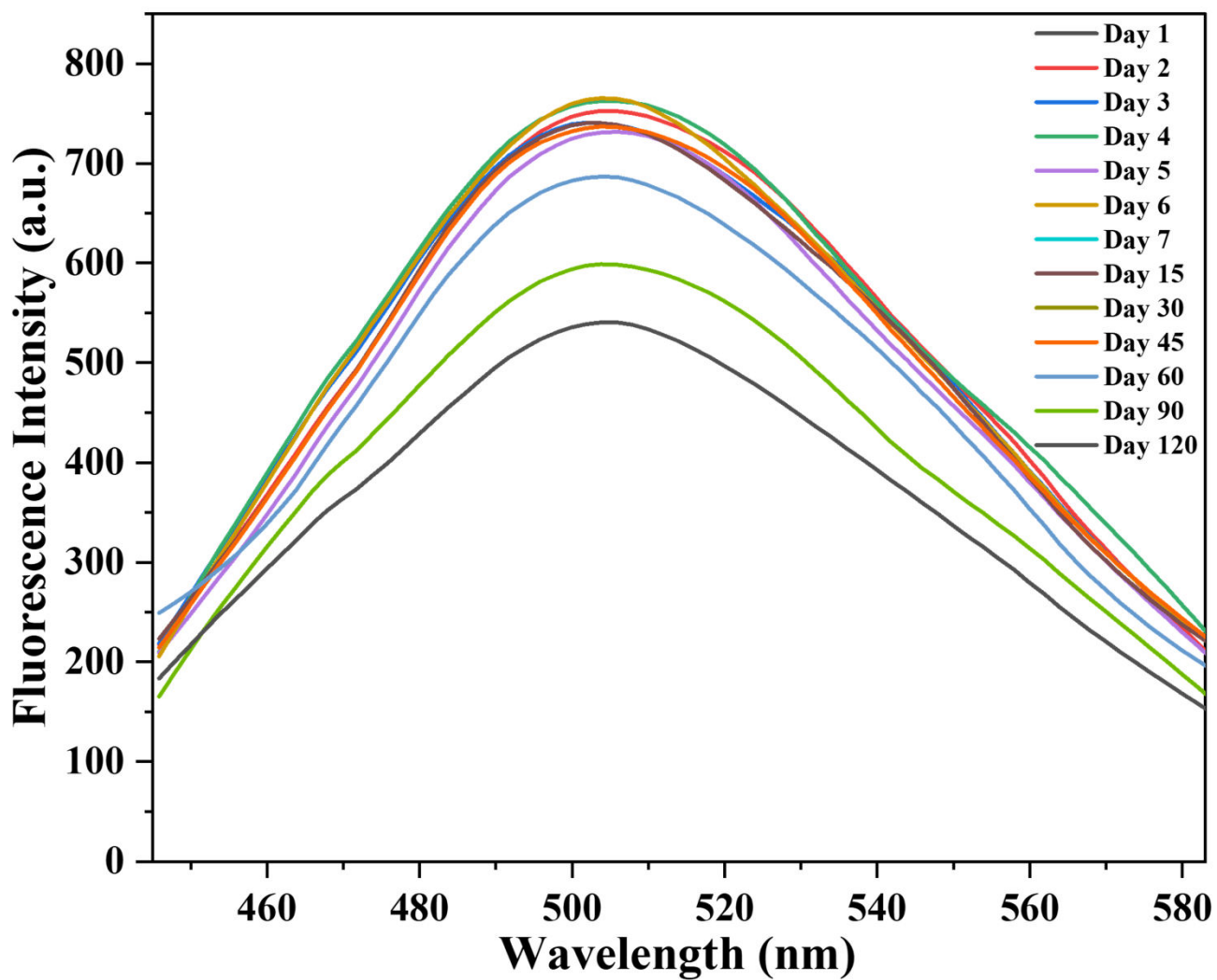


Figure S5. Evaluation of *V. negundo*-MoNCs stability from day 1 to day 120.

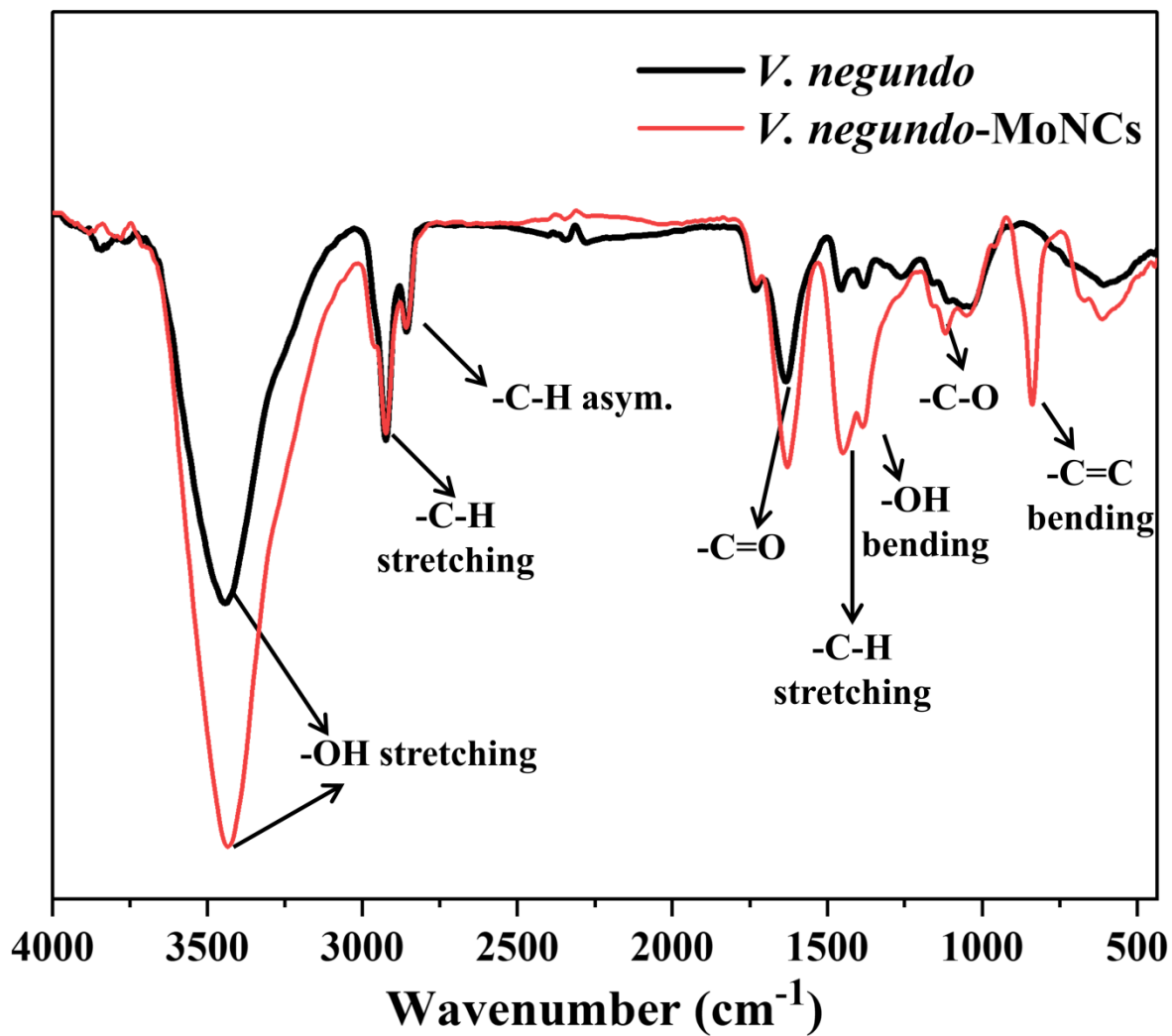


Figure S6. FTIR characterization of *V. negundo* and *V. negundo*-MoNCs.

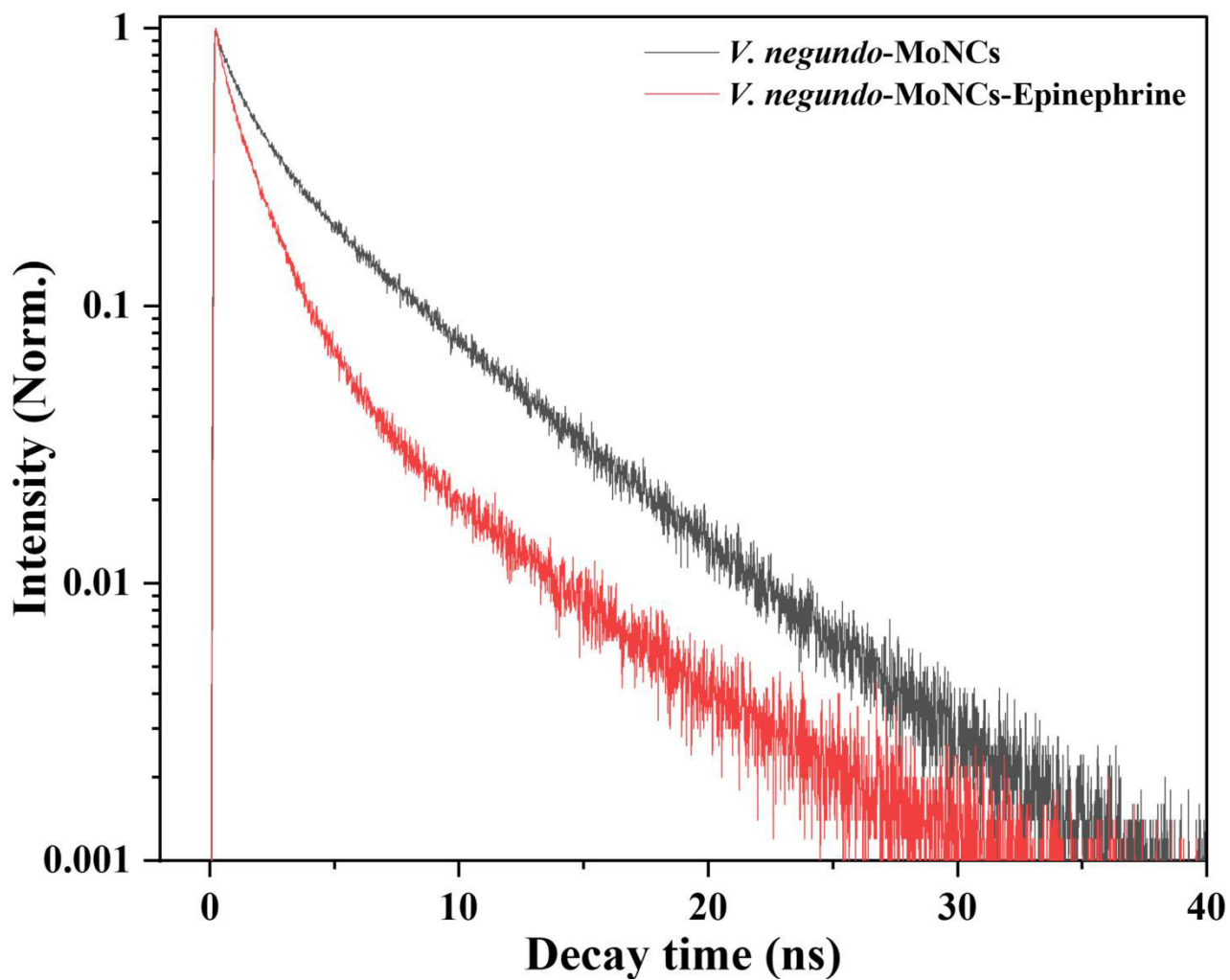


Figure S7. Fluorescence lifetime analysis of *V. negundo*-MoNCs and *V. negundo*-MoNCs with epinephrine.

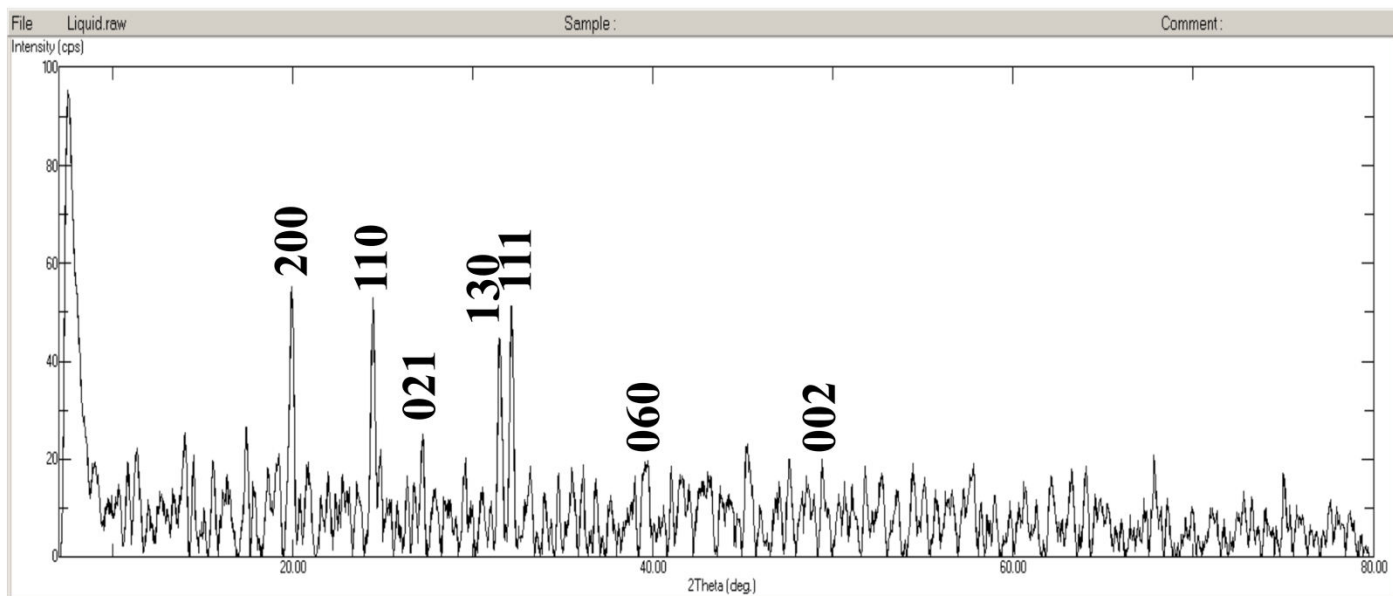


Figure S8. XRD pattern of *V. negundo*-MoNCs.

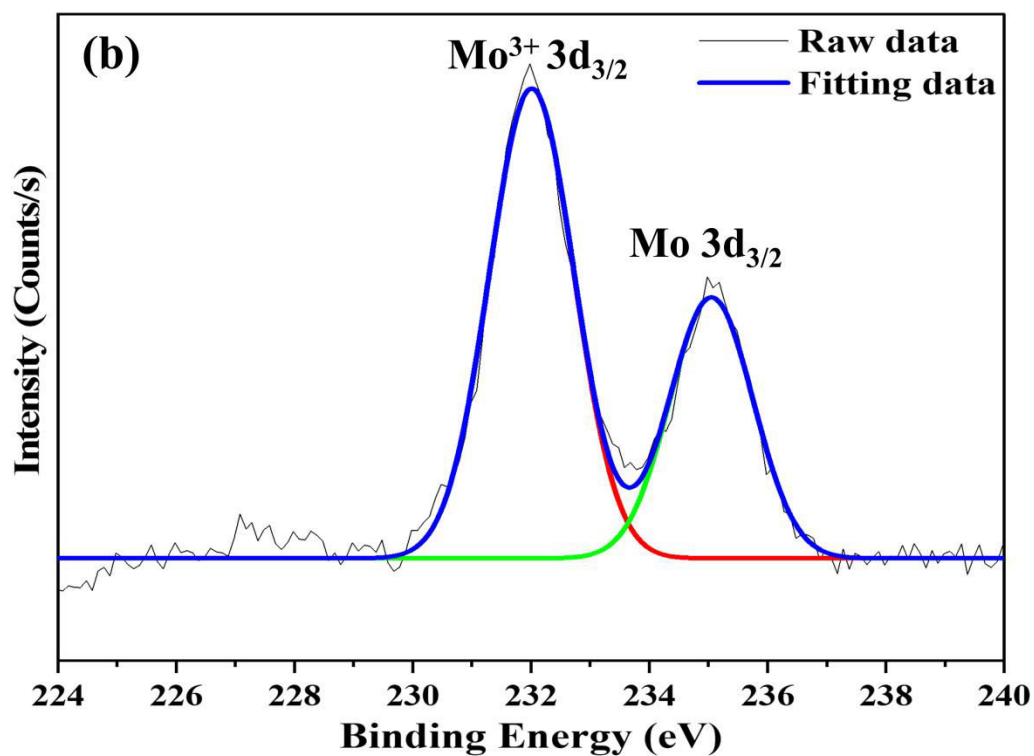
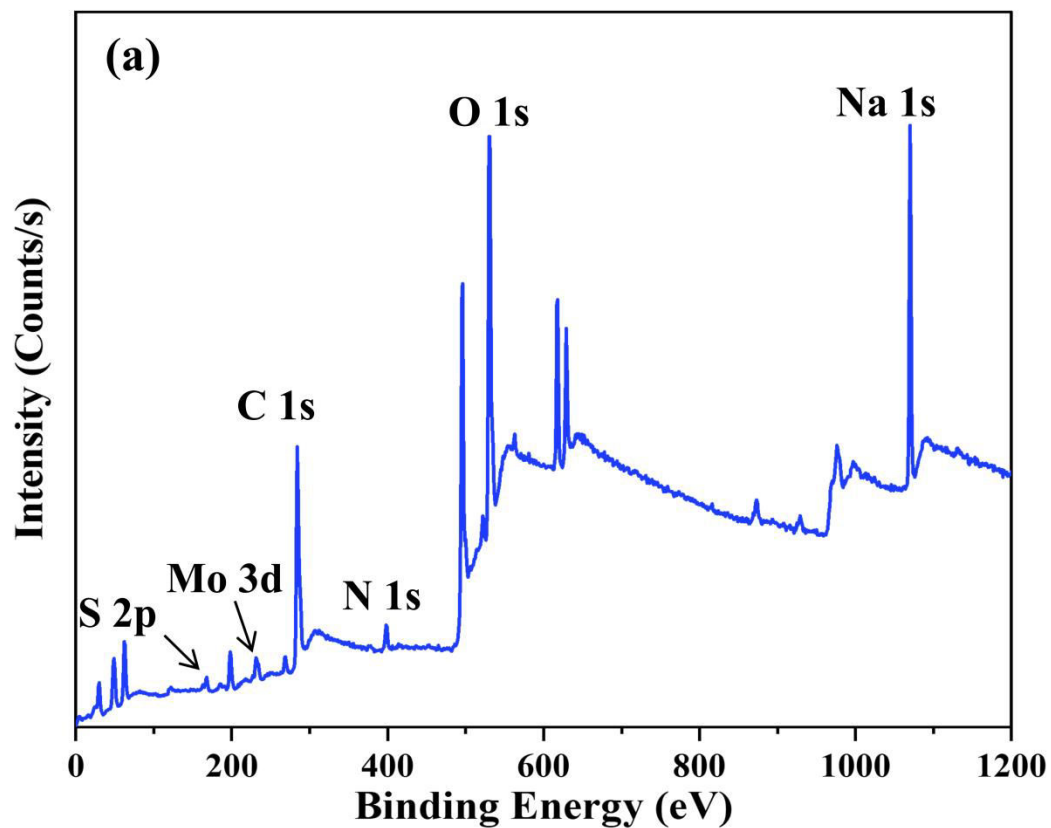


Figure S9. (a) XPS survey spectra of *V. negundo*-MoNCs and (b) XPS fitting spectra of Mo 3d showing two oxidation states of Mo in *V. negundo*-MoNCs.

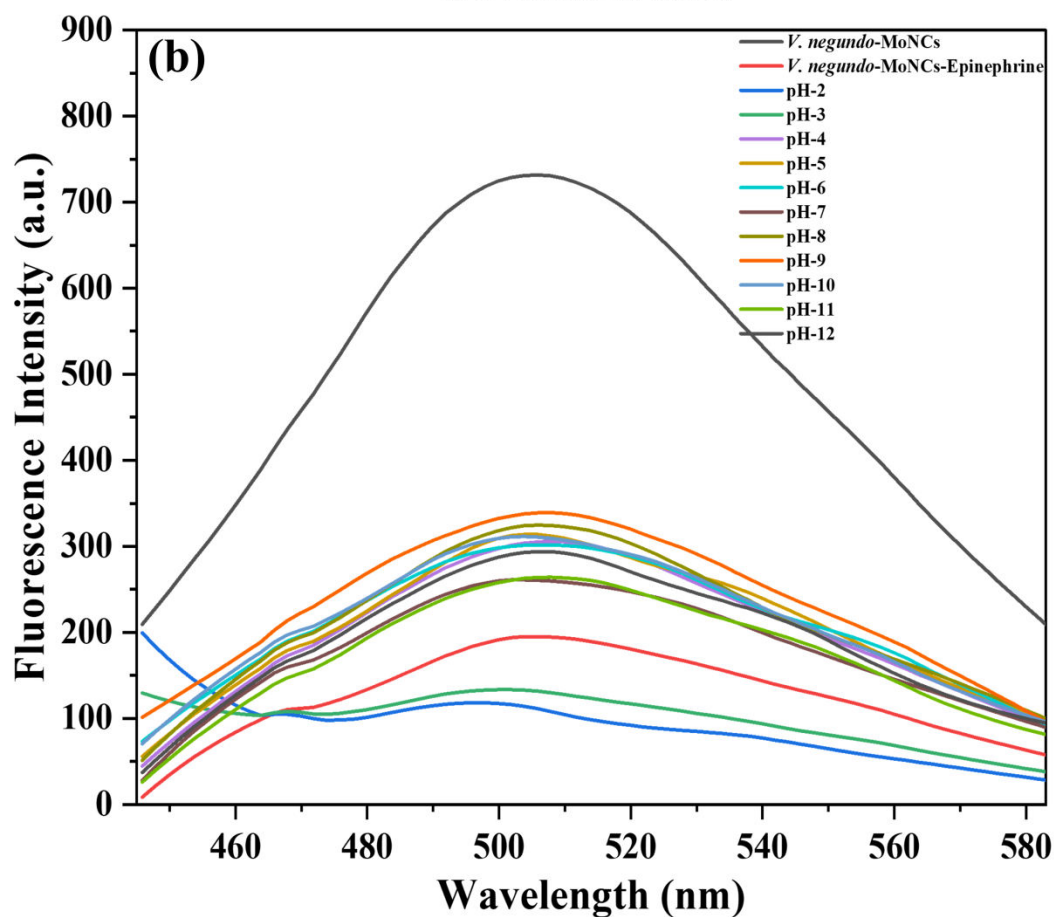
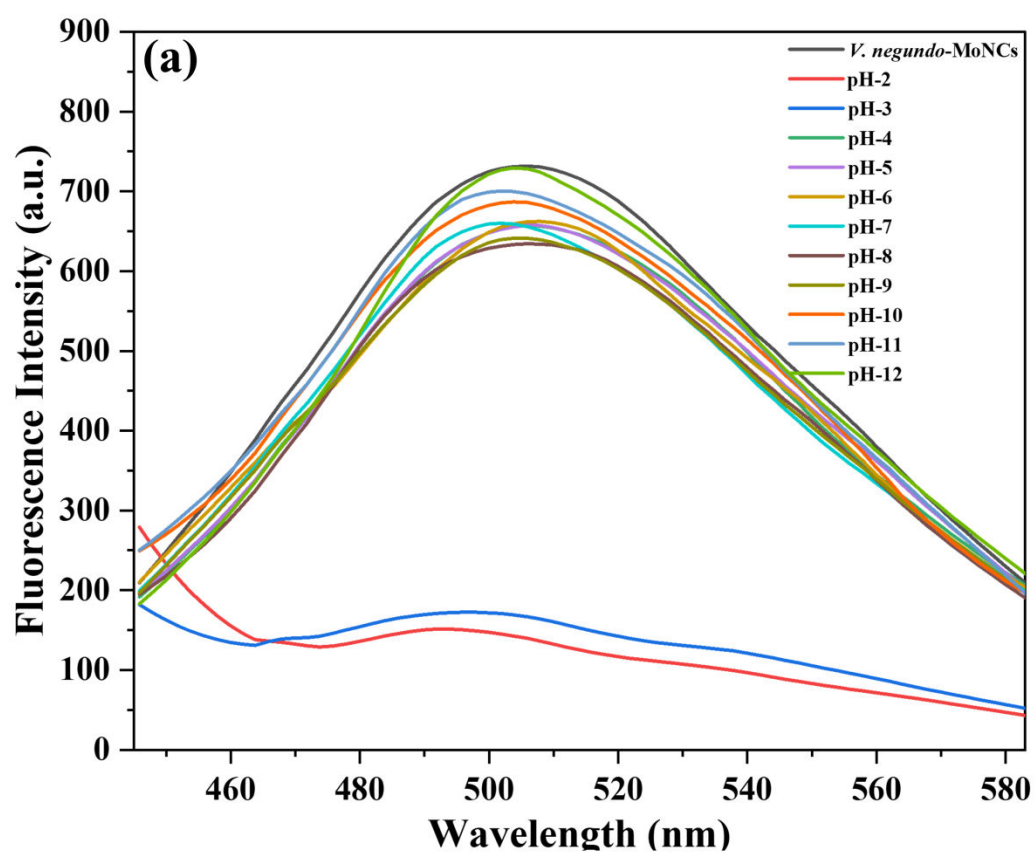


Figure S10. (a) PBS pH (2.0 to 12.0) effect on fluorescence spectra of *V. negundo*-MoNCs (b) and *V. negundo*-MoNCs with epinephrine.

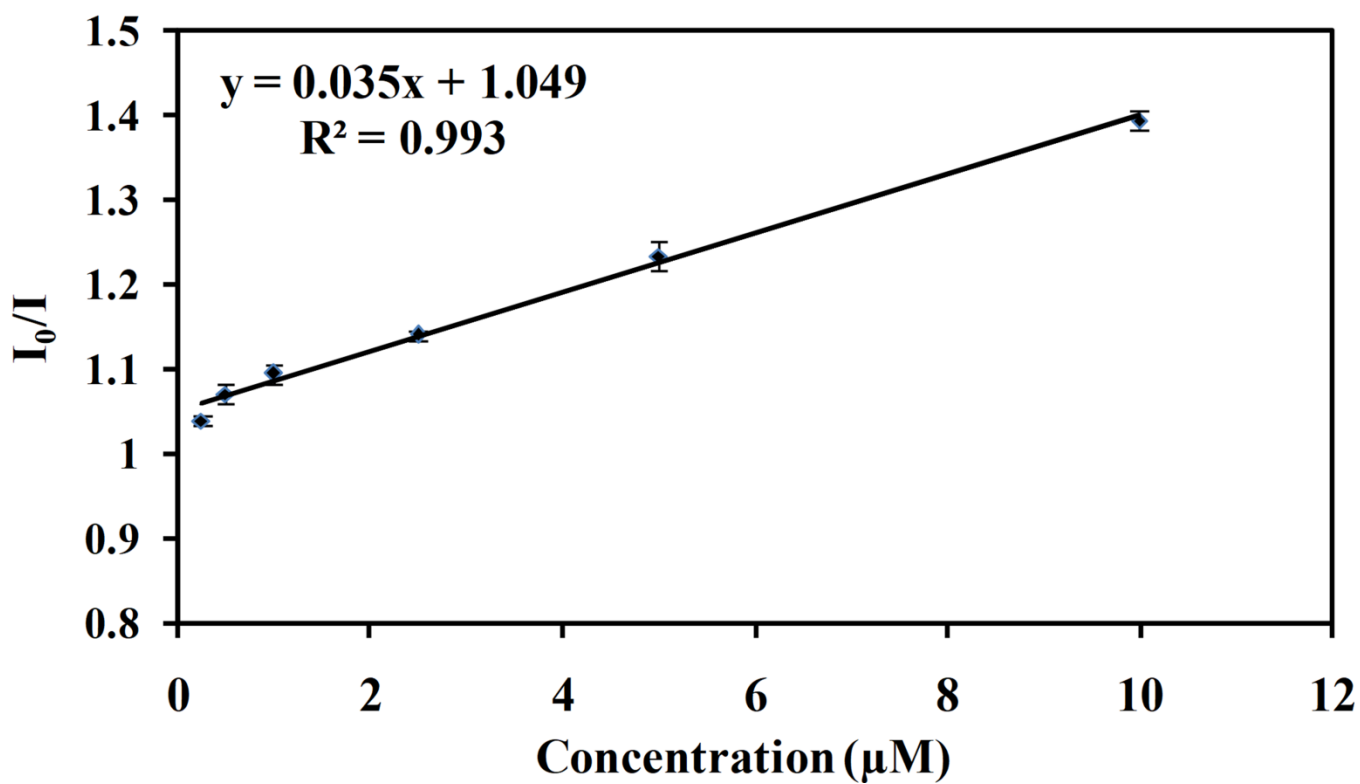


Figure S11. Calibration curve plotted between I_0/I ratio of *V. negundo*-MoNCs at 495 nm with concentration of epinephrine increasing in range of 0.25-10 μM.

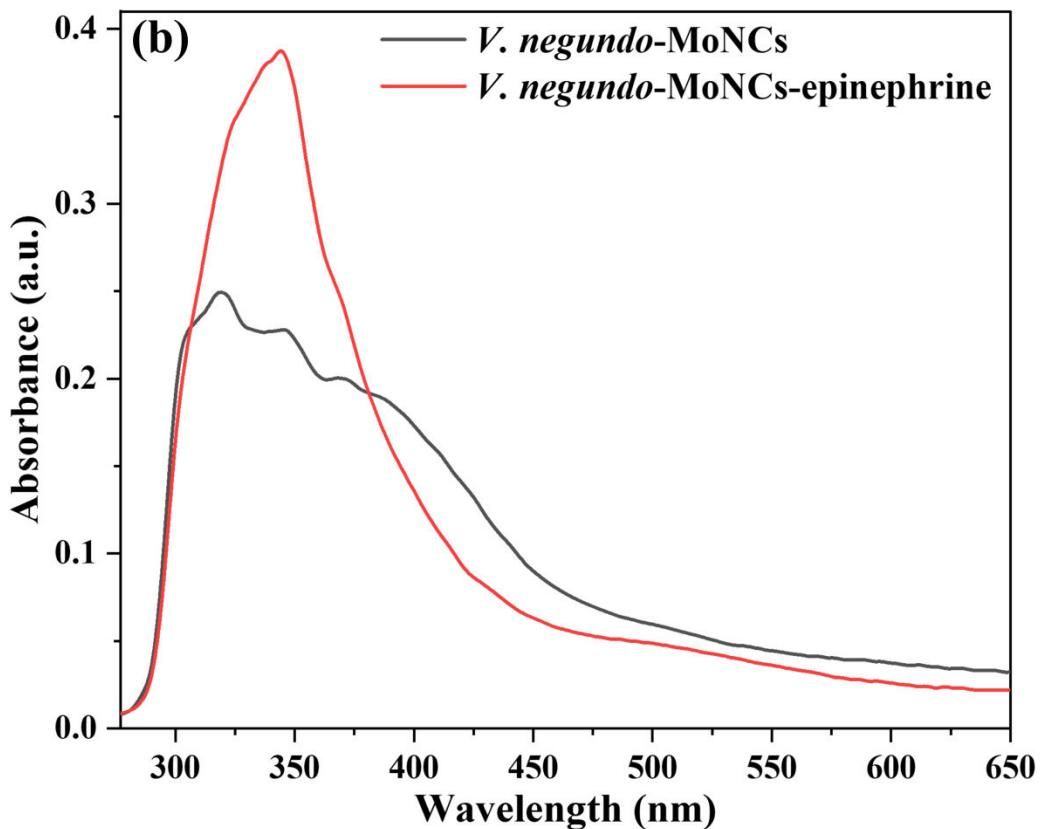
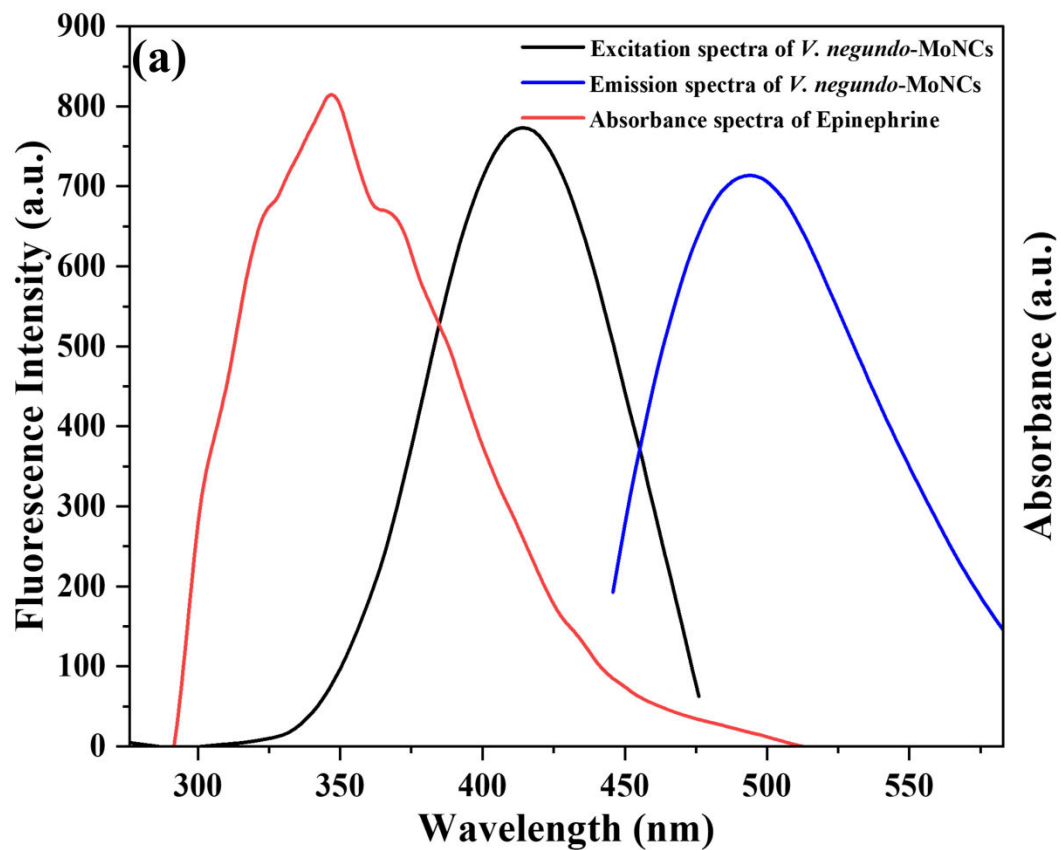


Figure S12. (a) Fluorescence excitation and emission spectra of *V. negundo*-MoNCs and absorbance spectra of epinephrine, (b) Absorbance spectrum of *V. negundo*-MoNCs and *V. negundo*-MoNCs-epinephrine.

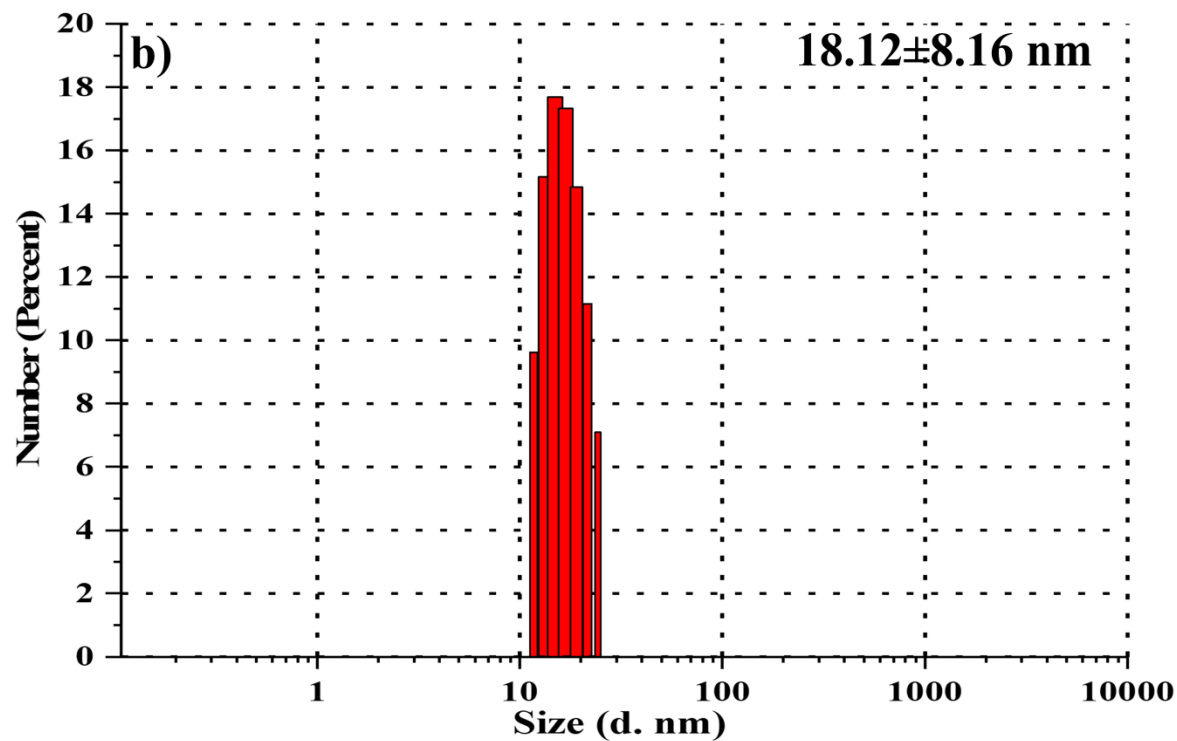
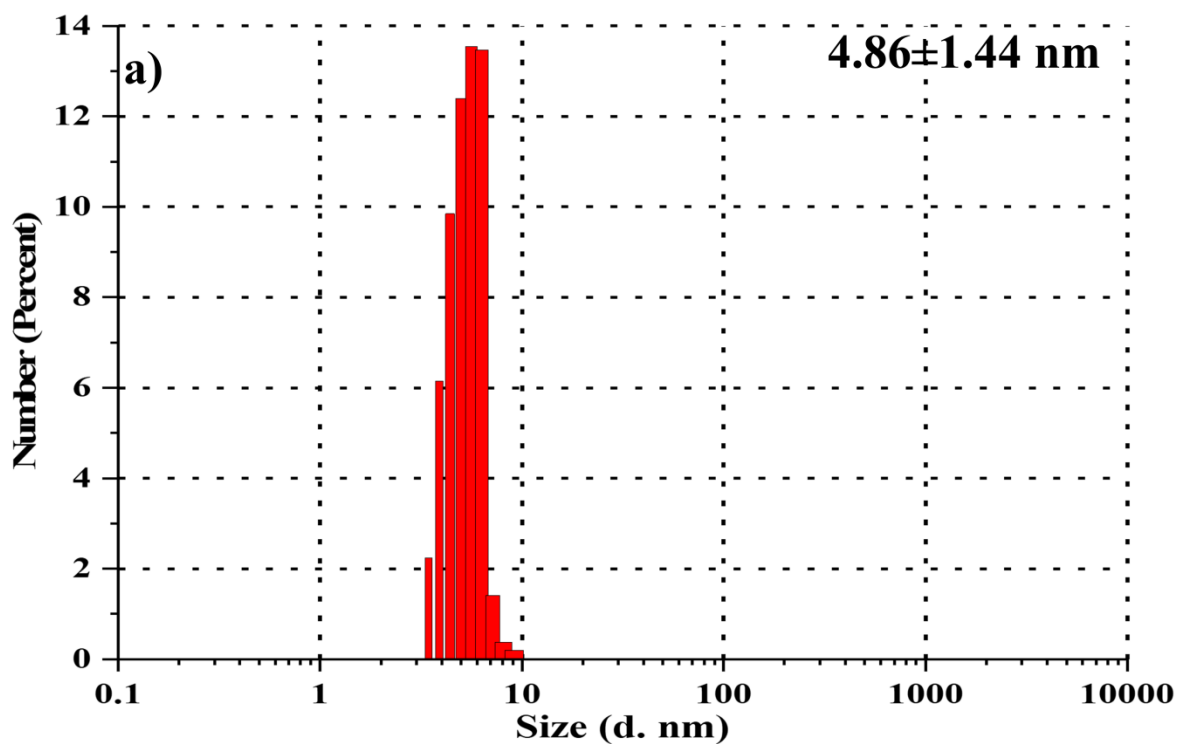


Figure S13. DLS of a) *V. negundo*-MoNCs b) *V. negundo*-MoNCs with epinephrine.

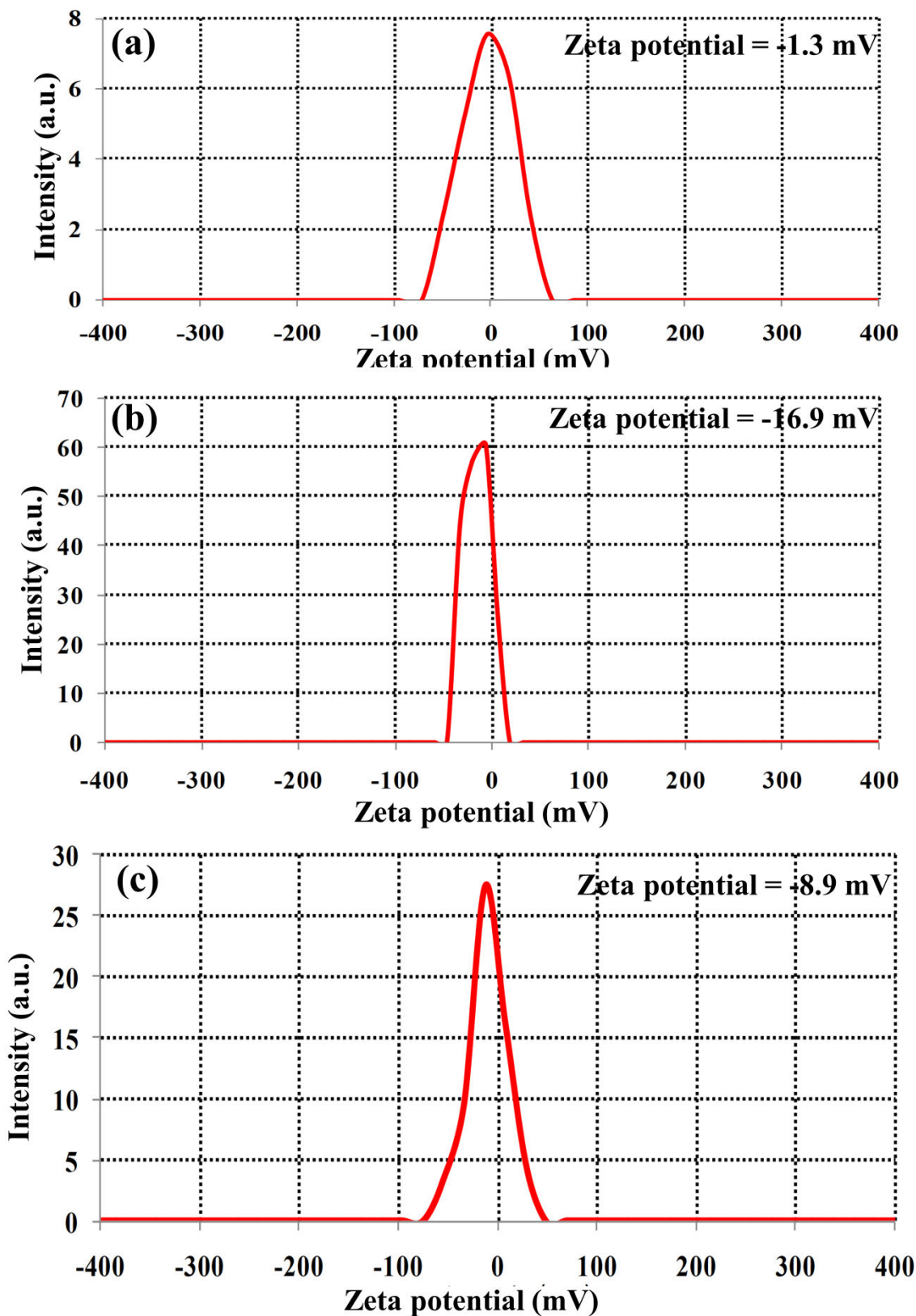


Figure S14. Zeta potential of a) Epinephrine b) *V. negundo*-MoNCs and c) *V. negundo*-MoNCs with epinephrine.

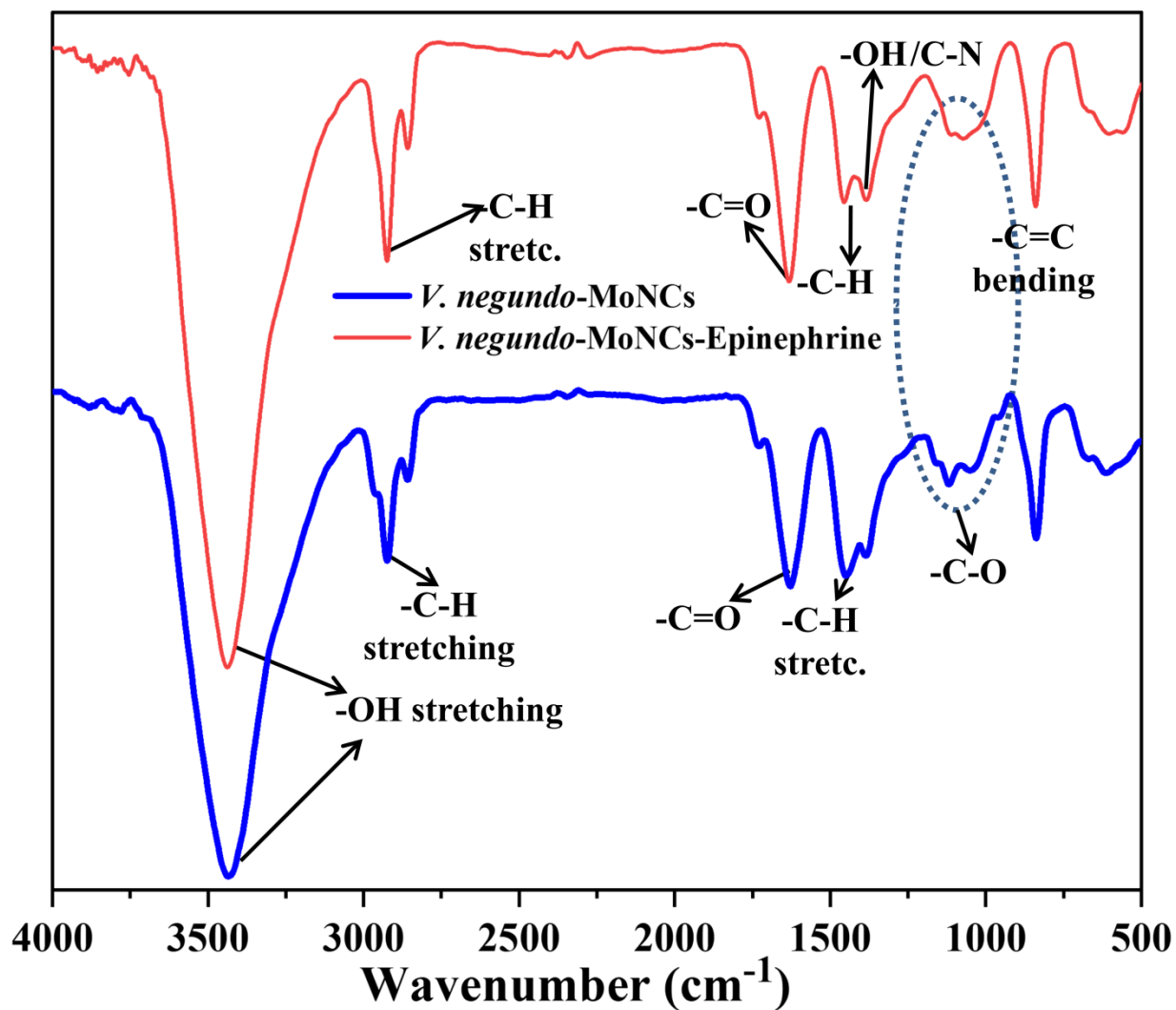


Figure S15. FTIR characterization of *V. negundo*-MoNCs and *V. negundo*-MoNCs with epinephrine.

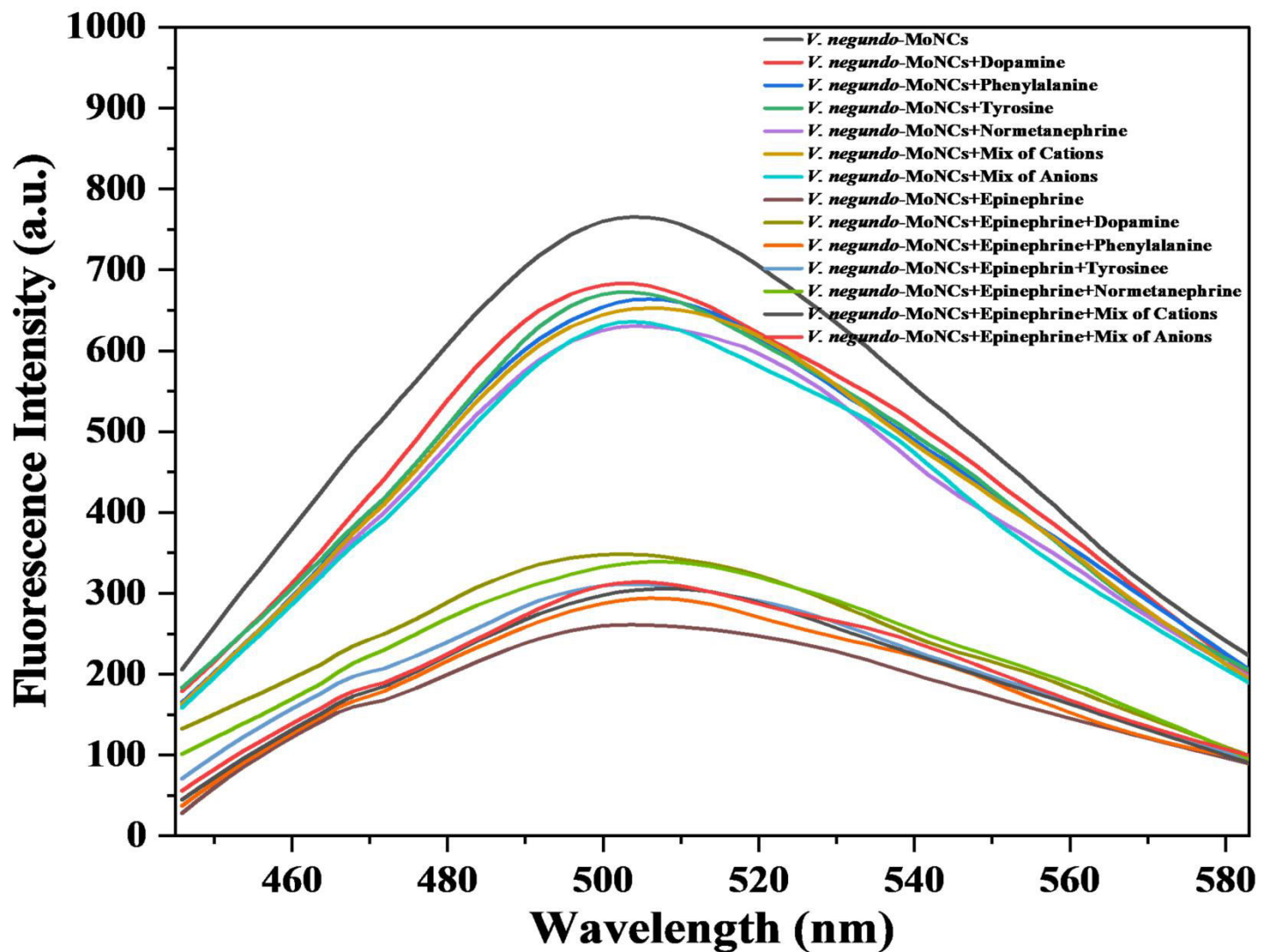


Figure S16. Interference study of *V. negundo*-MoNCs with various biomarkers (dopamine, phenylalanine, tyrosine, normetanephrine), cations and anions in presence of epinephrine.

Table S1. Analysis of epinephrine in pharmaceutical sample by using *V. negundo*-MoNCs as a probe.

Biomarker	Sample	Added concentration (μM)	Found concentration (μM)	Recovery (%)	RSD (%)
Epinephrine	Adrenaline injection	100	98.54	98.54	1.38
		250	246.83	98.73	1.23
		500	497.05	99.41	1.58