

Carbon dot based sensing of Dopamine and Ascorbic Acid

Upama Baruah^a, Neelam Gogoi^a, Achyut Konwar^a, Manash Jyoti Deka^a, Devasish Chowdhury^{a*}, Gitanjali Majumdar^{b*}

a Material Nanochemistry Laboratory, Institute of Advanced Study in Science and Technology, Paschim boragaon, Garchuk, Guwahati – 781035

b Department of Chemistry, Assam Engineering College, Jalukbari, Guwahati – 781013

SUPPLEMENTARY MATERIAL

The photoluminescence (PL) spectrum of carbon dots at various excitation wavelengths was recorded. The carbon dot solution exhibited emissions at 425 nm, 438 nm, 445 nm, 453 nm, 470 nm and 480 nm respectively for excitations at 320 nm, 340 nm, 360 nm, 380 nm, 400 and 420 nm respectively. The stacked PL emission spectra of carbon dots with excitation in the range 320-420 nm is shown in Figure S1.

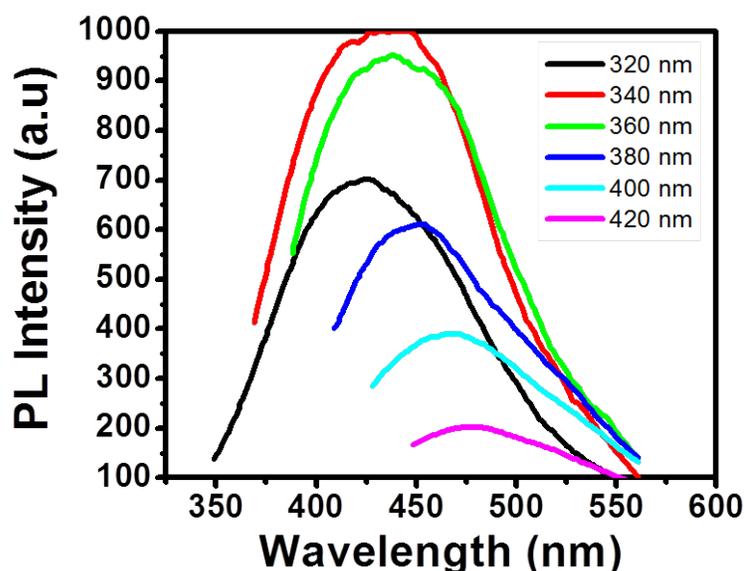


Figure S1: The stacked PL emission spectra of carbon dots with excitation in the range 320-420 nm.

In order to demonstrate the role of acetic acid in the preparation of carbon dots we tried to prepare carbon dots also in ethanol. It was observed that the fluorescence from CDs was considerably less in ethanol medium compared to that in 0.1 M acetic acid. The reason behind this could only be the polarity of the medium. As ethanol is less polar than acetic acid the CDs

prepared from tea which are rich in –OH groups are very well dispersed in acetic acid giving strong emission. The PL emission spectra of CDs in both acetic acid and ethanol media are shown in Figure S2.

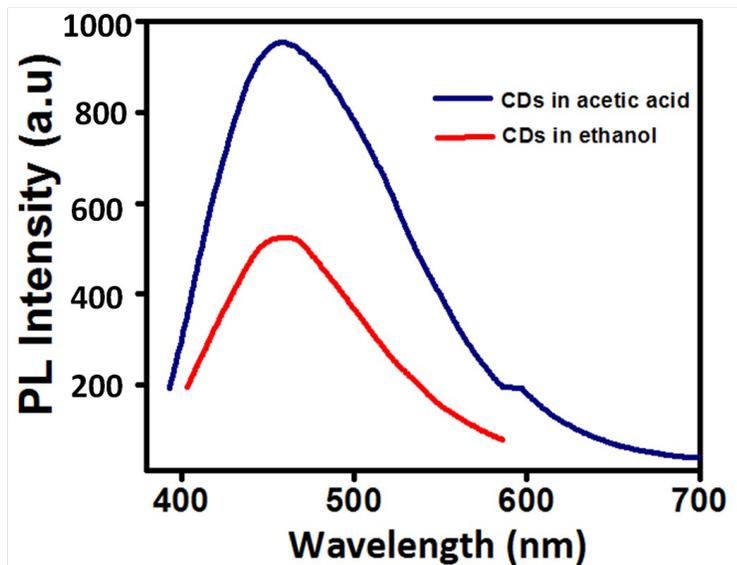


Figure S2: The PL emission spectra of CDs in acetic acid and ethanol media showing greater PL intensity in acetic acid media.

To determine the PL stability of carbon dots with respect to pH, we recorded the PL spectra of carbon dots at four different pH values. It was observed that the carbon dots prepared at pH= 3.7 i.e., the one reported exhibited maximum PL intensity compared to that at pH= 2, pH= 7 or pH= 12. This is an indication of the greater stability of the as prepared carbon dots i.e., at pH= 3.7. The comparative PL spectra are shown in Figure S2.

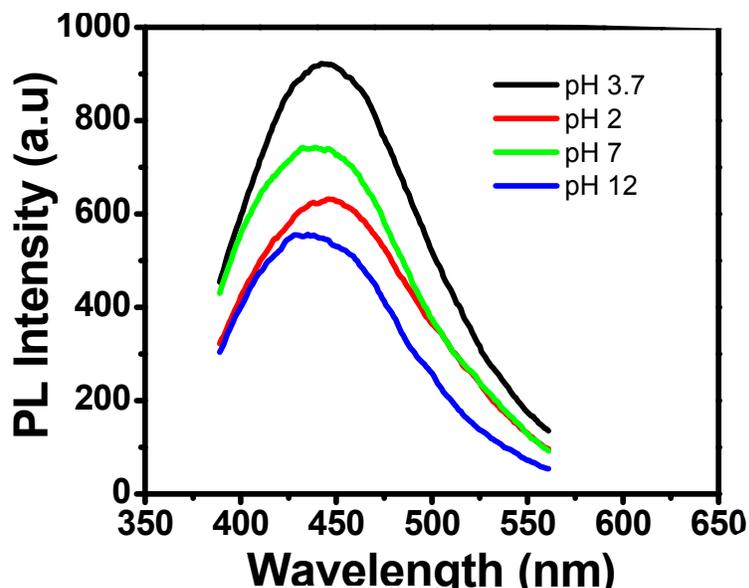


Figure S3: Comparitive PL emission spectra of carbon dots at four different pH values.