Controllable synthesis of biosourced blue-green fluorescent Carbon dots from camphor for the detection of heavy metal ions in water

Rohit Ranganathan Gaddam ,[a,b] Vasudevan Devanath ,[c] Ramanuj Narayan ,[a] and KVSN Raju*[a]

[a] *Polymers and Functional Materials Division, Indian Institute of Chemical Technology, Tarnaka 500007, Andhra Pradesh. E-mail: drkvsnraju@gmail.com*

[b] *Amity Institute of Nanotechnology, Amity University, Noida 201301, Uttar Pradesh, India.*

[c] *Electrodics and electrocatalysis division, Central Electrochemical Research Institute, Karaikudi-630006, Tamil Nadu, Email : vasudevand@rediffmail.com*

**Corresponding author. : E-mail addresses: drkvsnraju@gmail.com*

Electronic Supplementary Information

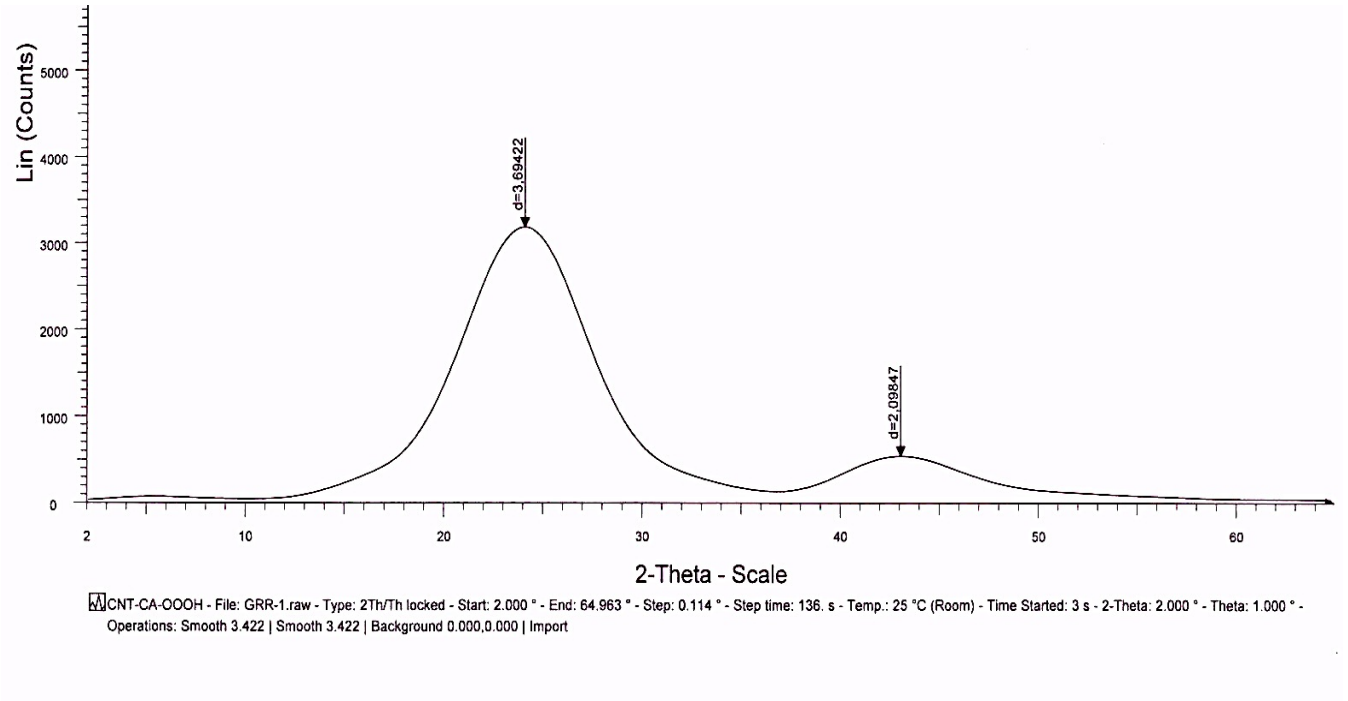

Figure S1 X-ray Diffraction pattern of Camphoric carbon soot

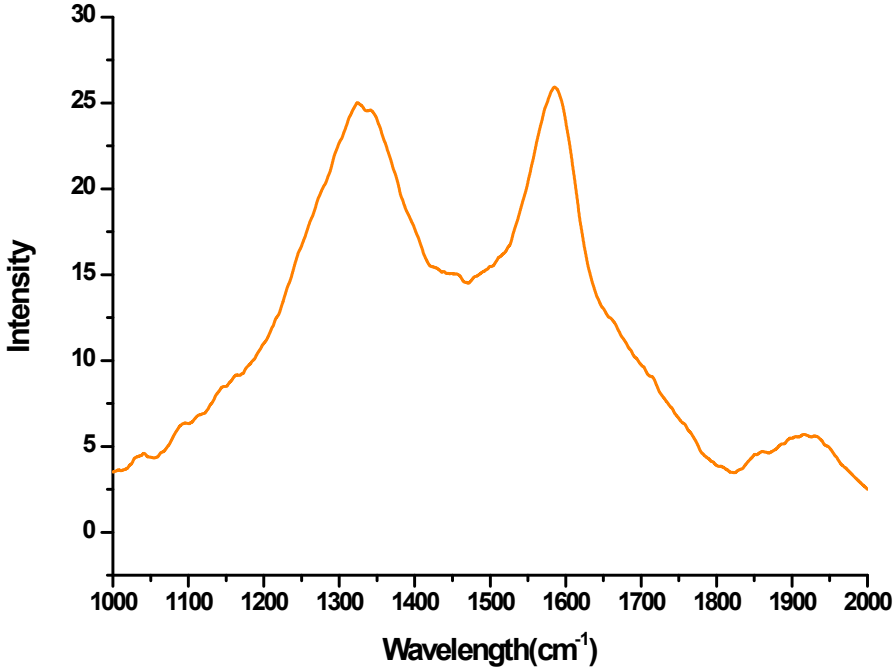

Figure S2 FTIR spectra of as prepared camphoric carbon soot

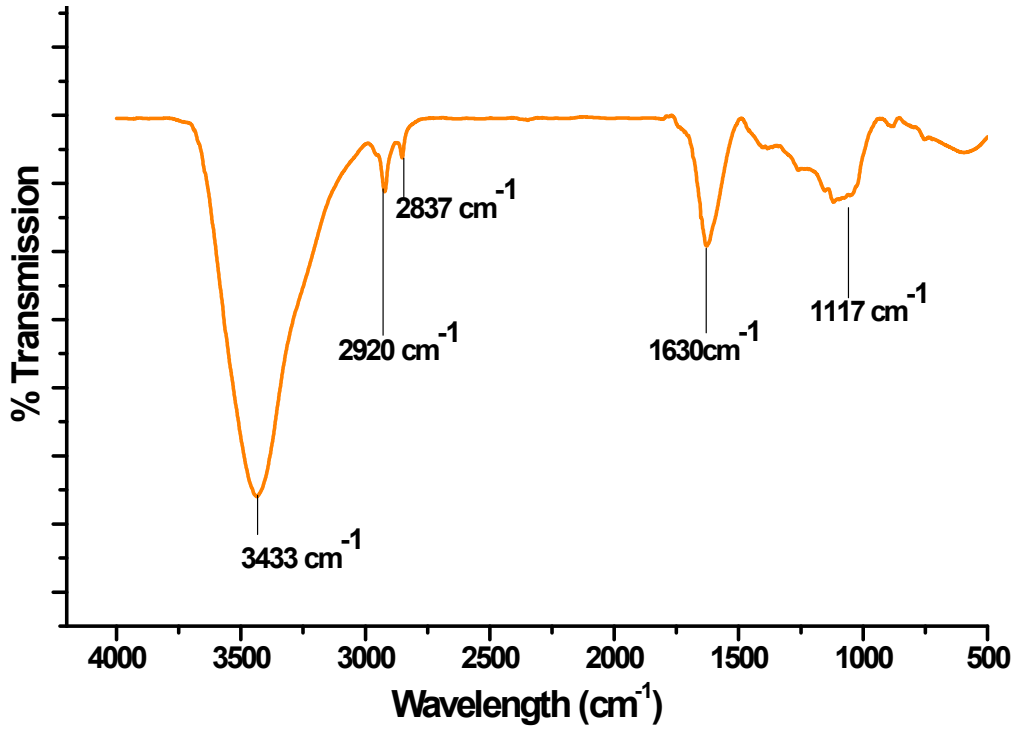

Figure S3 FTIR spectra of as prepared camphoric carbon soot

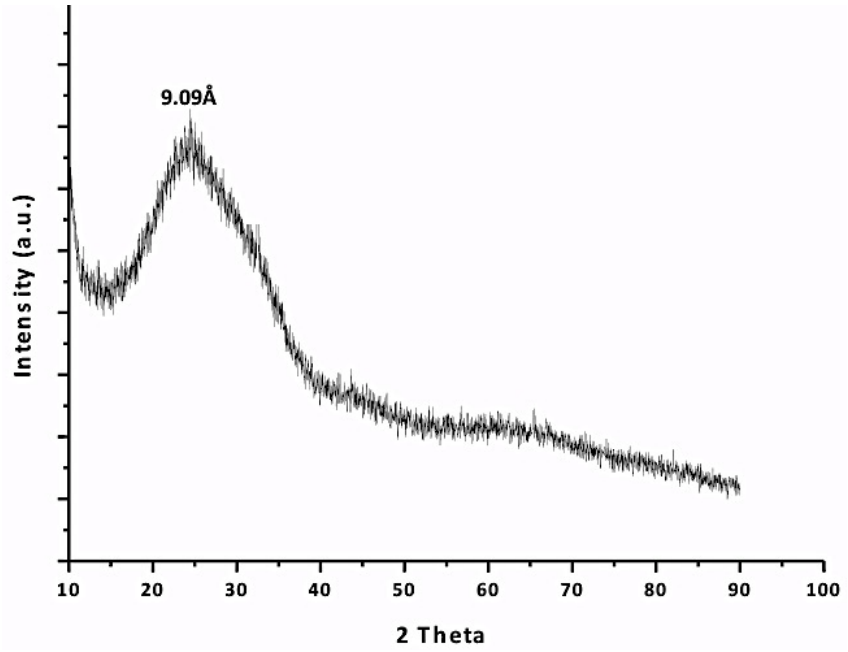

Figure S4 X-Ray Diffraction profile of carbon dots

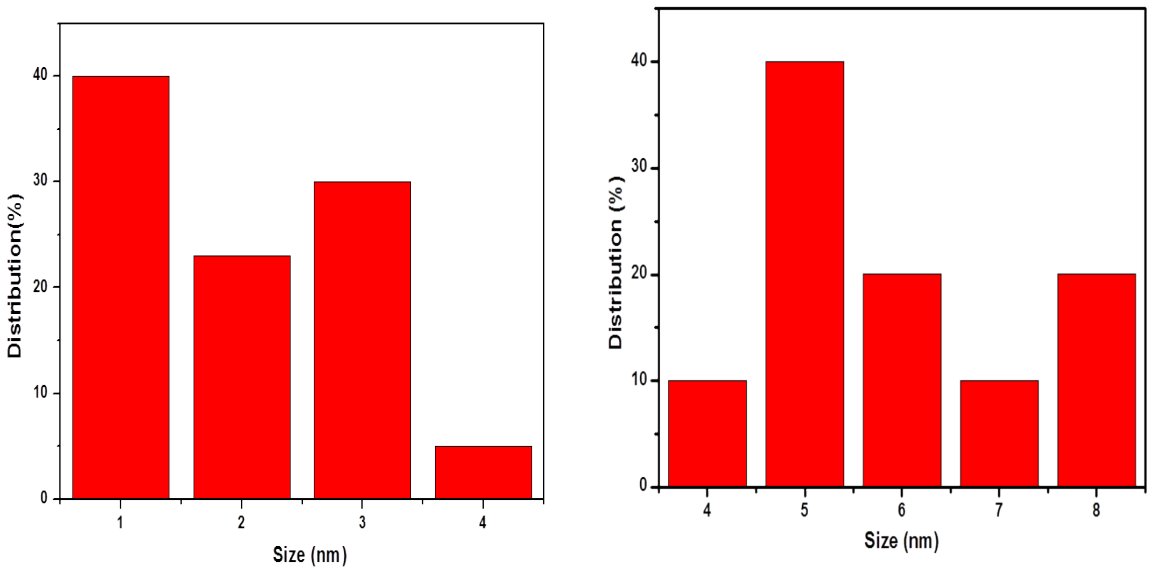

Figure S5. Size distribution profile of C dots before dialysis (left) and after dialysis (right)

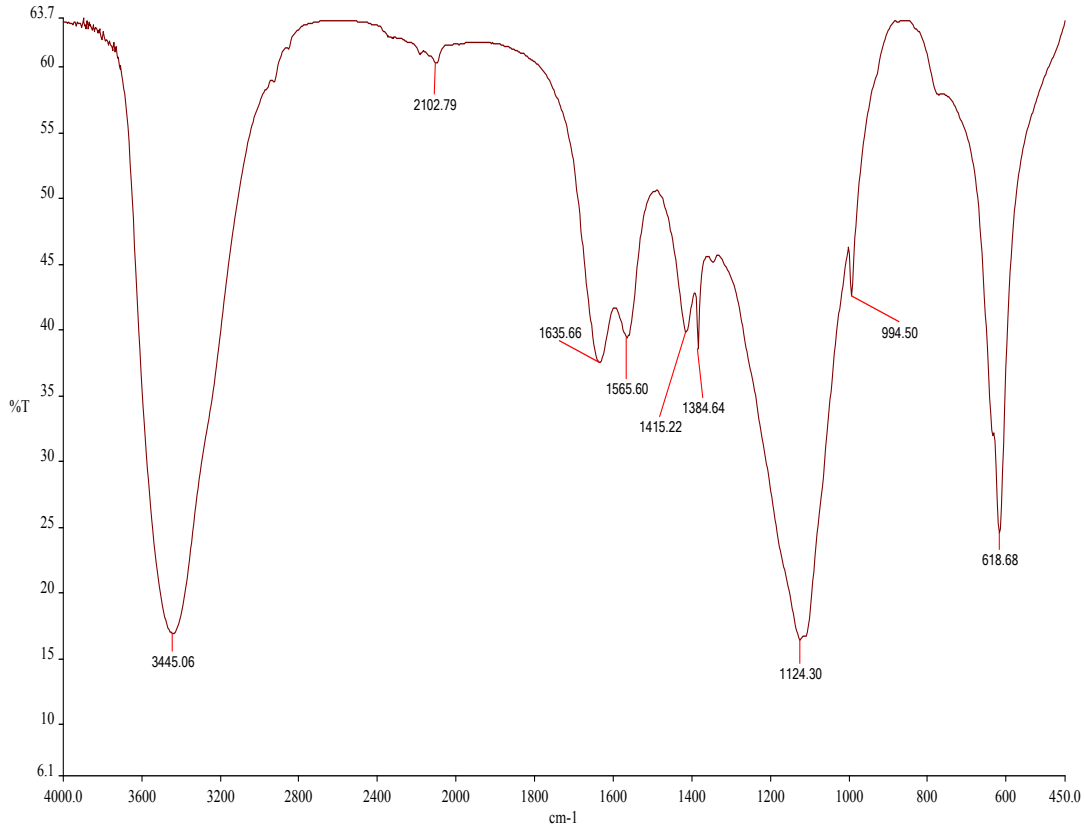

Figure S6 FTIR spectra of C dots before dialysis

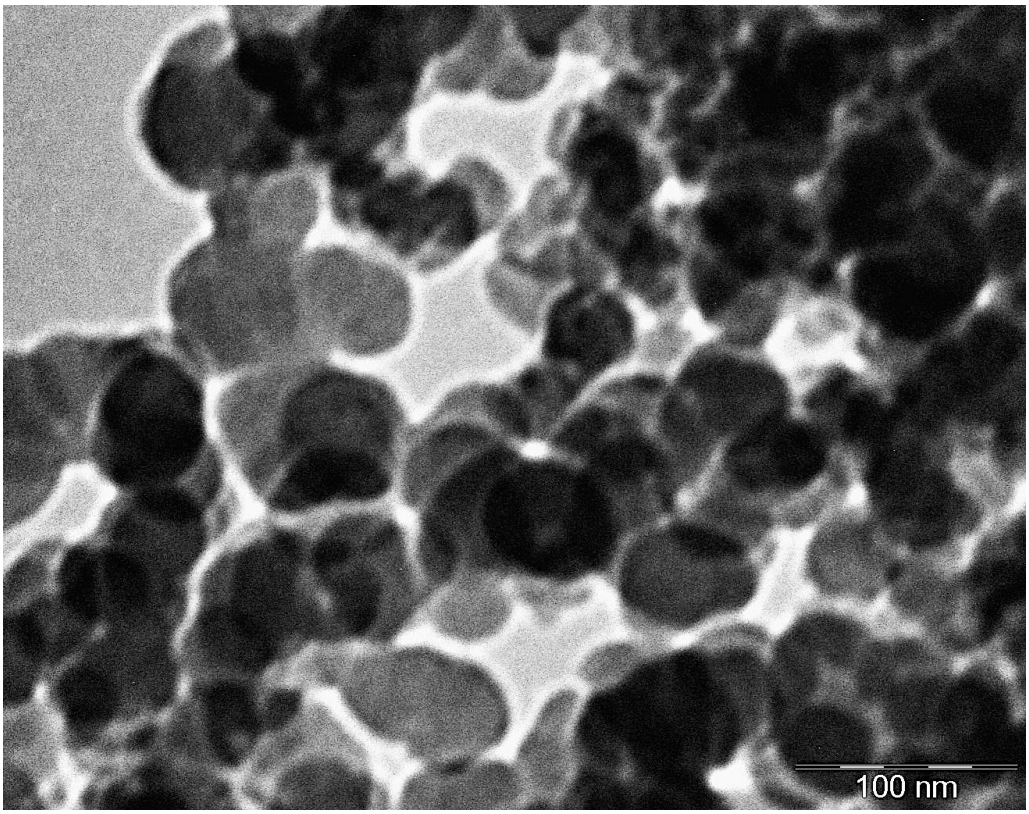

Figure S7 TEM image of as prepared camphoric carbon soot

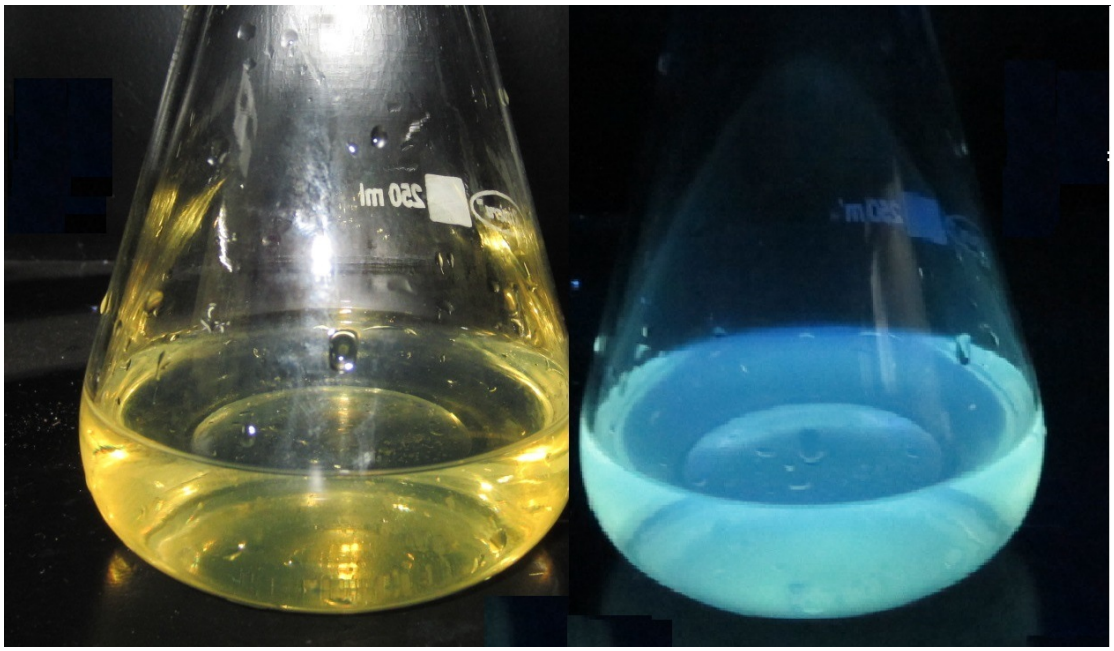

Figure S8 As prepared carbon dots (left) viewed under ultraviolet light (right)

Quantum Yield Measurements

Quinine sulfate in 0.1 M H_2SO_4 was used as a standard to determine the quantum yield of C dots. The absorbance and emission spectra of the standard were recorded. The pure C dot absorbance and emission was also taken (figures already in the manuscript Fig. 6a and 6b). The following formula was used to determine the quantum yield of C dot[1]:

$$\Phi_{C\ dot} = \Phi_{Std} \left[\frac{I_{C\ dot}}{I_{std}}\right] \left[\frac{A_{std}}{A_{C\ dot}}\right] \left[\frac{\eta_{C\ dot}}{\eta_{std}}\right]^2$$

Where Φ is the quantum yield, I is the measured integrated emission intensity, η is the refractive index, and A is the optical density. The subscript "std" refers to the reference fluorophore of known quantum yield. The subscript C dot refers to the pure graphene quantum dot. The quantum yield of the C dot is found to be 21.16% according to the above equation.

Reference:

1. *Lakowicz, J. R. Principles of Fluorescence Spectroscopy, 2nd Ed., 1999, Kluwer Academic/Plenum Publishers, New York.*