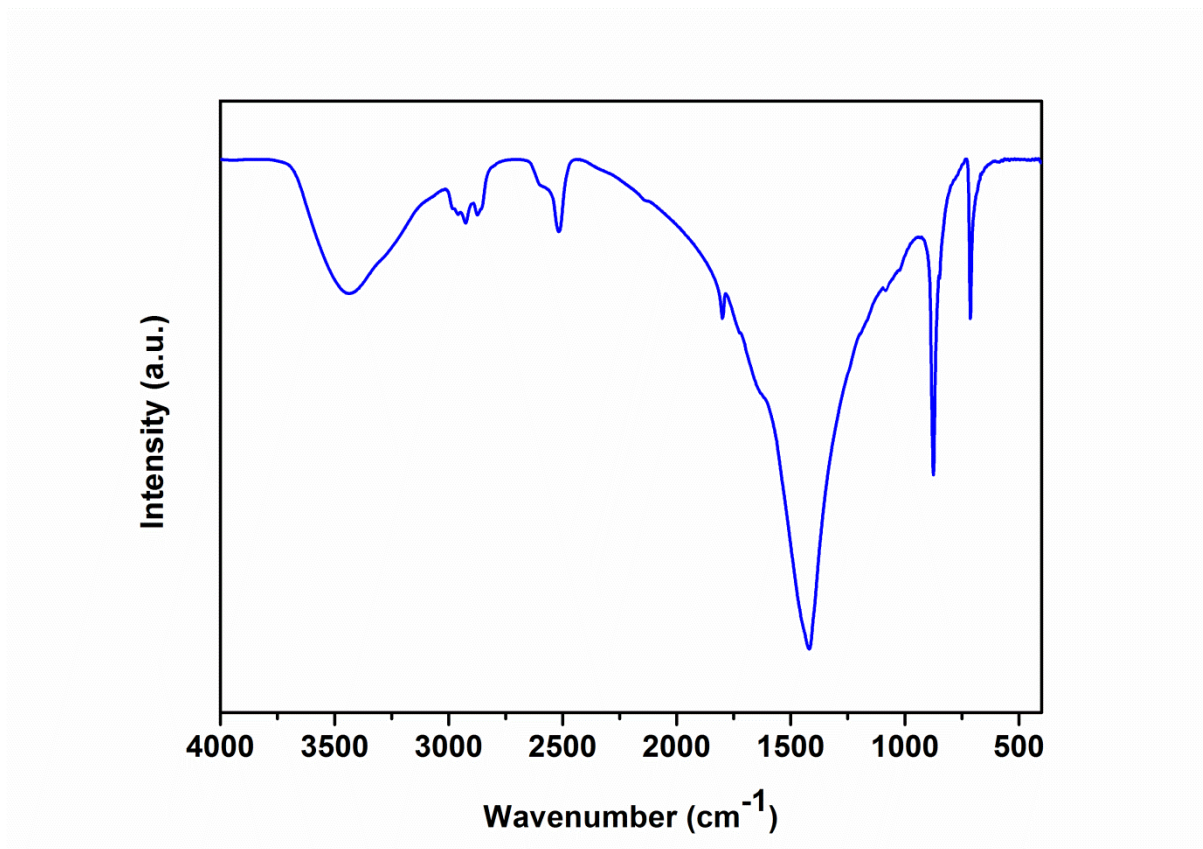


## **Electronic Supplementary Information**

### **Characterization Techniques**

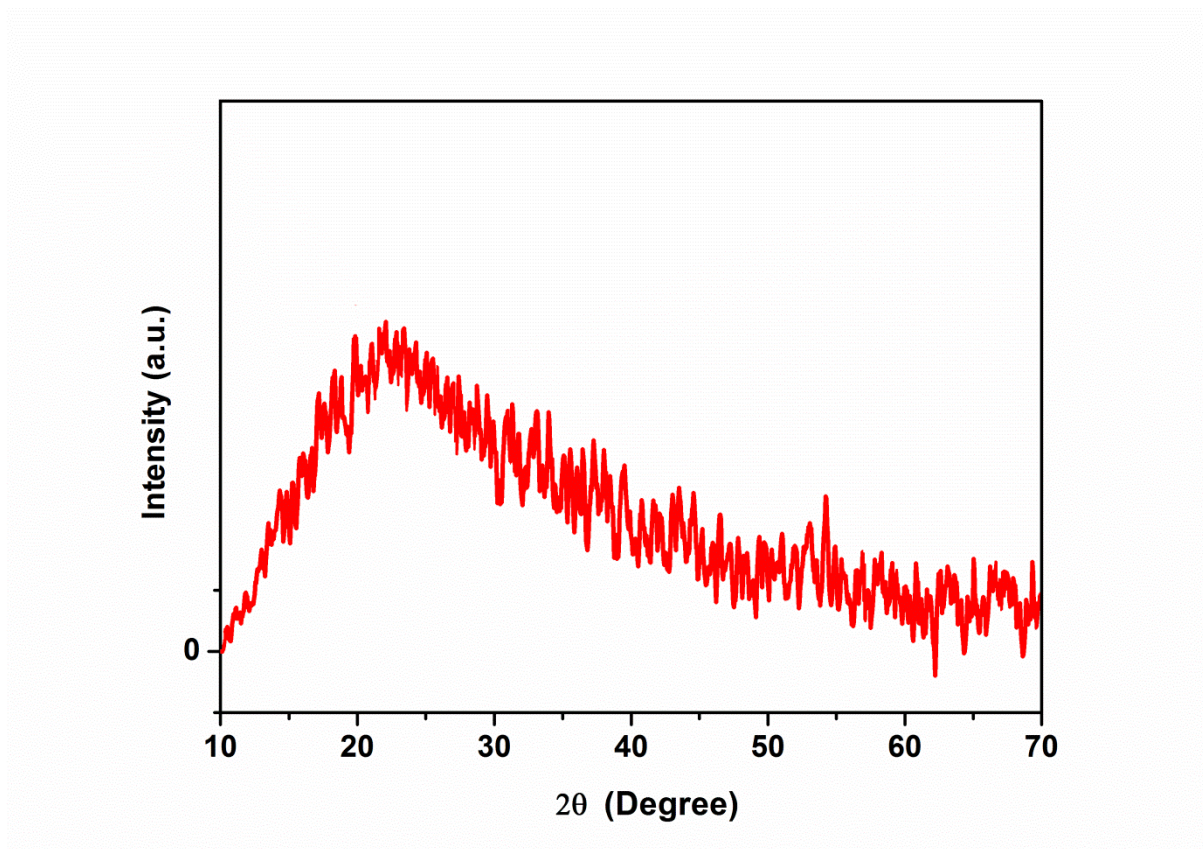
Fourier transformed Infrared (FTIR) spectra were recorded on a PerkinElmer, USA spectrometer using KBr pellets. X-ray diffraction (XRD) patterns were recorded by using by an X-ray diffractometer of Miniflex, Rigaku Corporation, Japan. UV-visible spectra were taken at room temperature using Thermo Scientific, USA photospectrometer. Elemental composition study was conducted by an electron dispersive X-ray (EDX) spectrometer of Oxford, JSM-6390LV. Raman spectra were recorded by a Raman spectrometer (Horiba Jobin Vyon, Model LabRam HR) using a laser source of wavelength 514 nm. The shape and size of HAp nanoparticles and their distribution were studied by using a high resolution transmission electron microscope (HRTEM; JEOL, JEMCXII; operating voltage 200 kV, Japan). TEM images were analyzed with Gatan Software for Inverse Fast Fourier Transform (IFFT) images. Thermogravimetric analysis was carried out by using a PerkinElmer 4000, USA thermal analyzer under nitrogen atmosphere at the temperature range of 25-800 °C (scanning rate 10 °C/min, gas flow rate 30 mL/min). Performance of the nanocomposite was studied by evaluating mechanical properties using a Universal Testing Machine (Zwick Z010, Germany equipped with a 10-kN load cell operating at crosshead speed of 50 mm/min).

## FTIR spectrum of eggshell



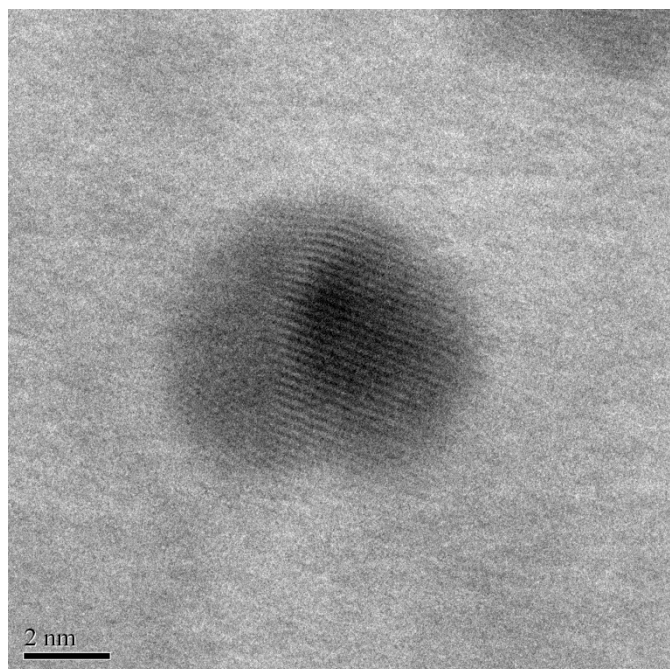
**Fig. S1** FTIR spectrum of eggshell.

**XRD pattern of carbon dot**



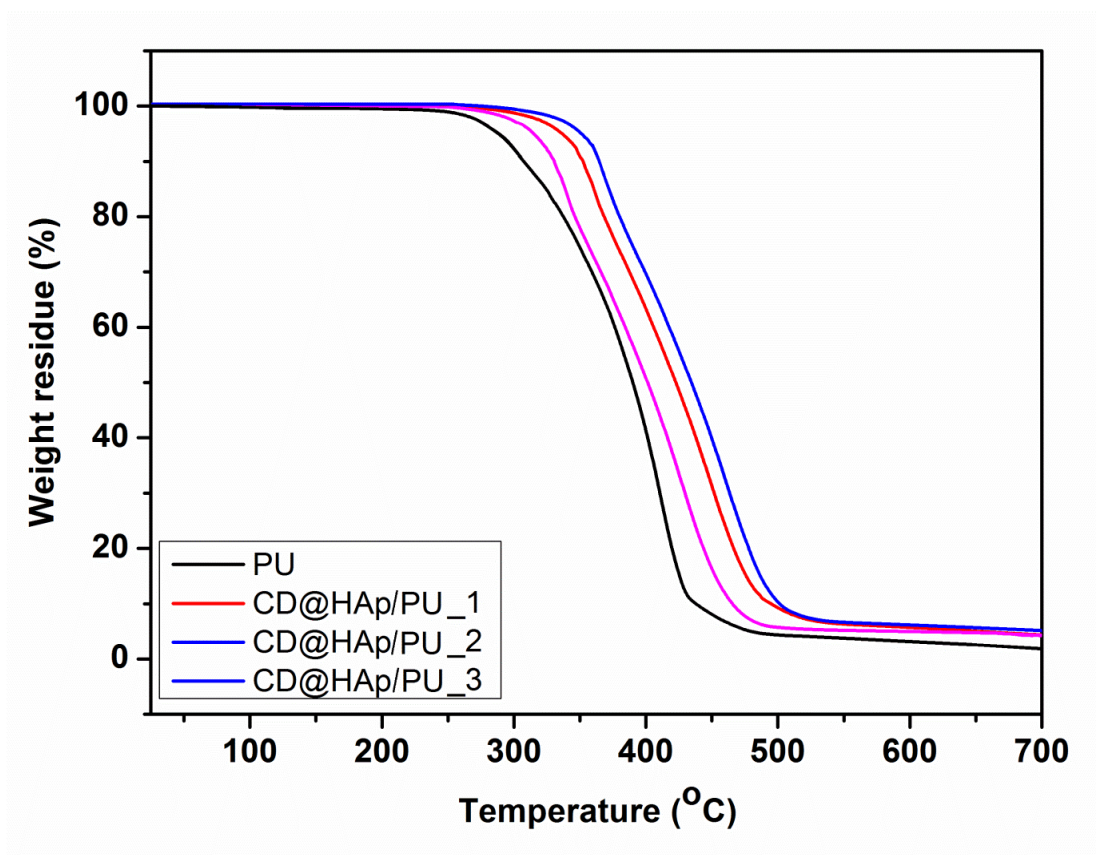
**Fig. S2** XRD pattern of CD.

**HRTEM of pristine carbon dot**



**Fig. S3** HRTEM of CD.

## TGA curves of the nanocomposite



**Fig. S4** TGA curves of CD@HAp/PUs.