Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Rapid and efficient removal of arsenic from water using electrospun CuO-ZnO composite nanofibers

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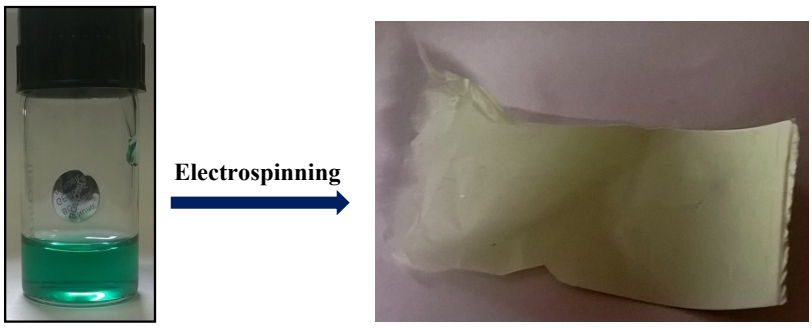

Figure S1 Copper Acetate/Zinc acetate/PVA blended solution electrospun to mat of nanofibers

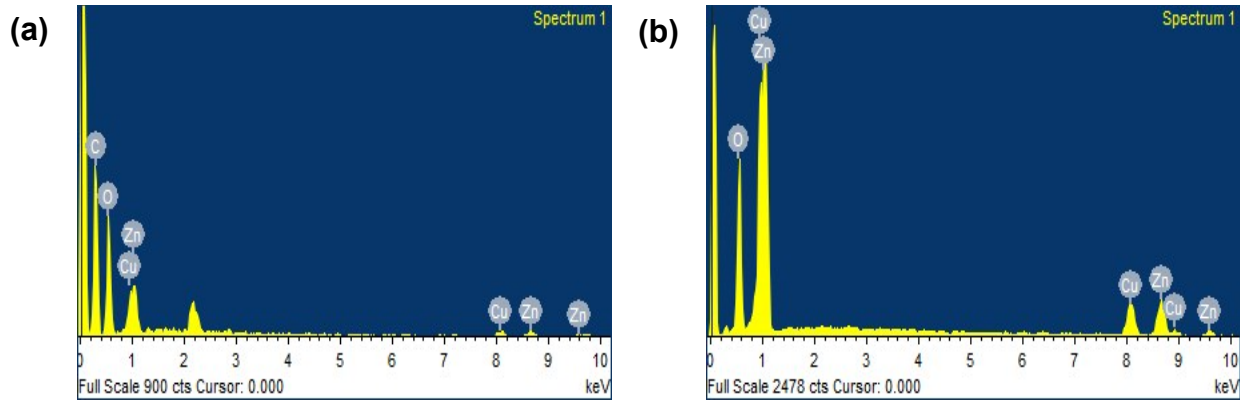

Figure S2 EDX spectra for (a) electrospun CuAc/ZnAc/PVA nanofibers, (b) CuO-ZnO nanofibers after calcination at 500˚C.

In Figure S2, there is a strong peak of Carbon along with Zn, Cu and O which is due to the presence polymer. But after calcination, the peak of carbon gets suppressed because of the elimination of the polymer.

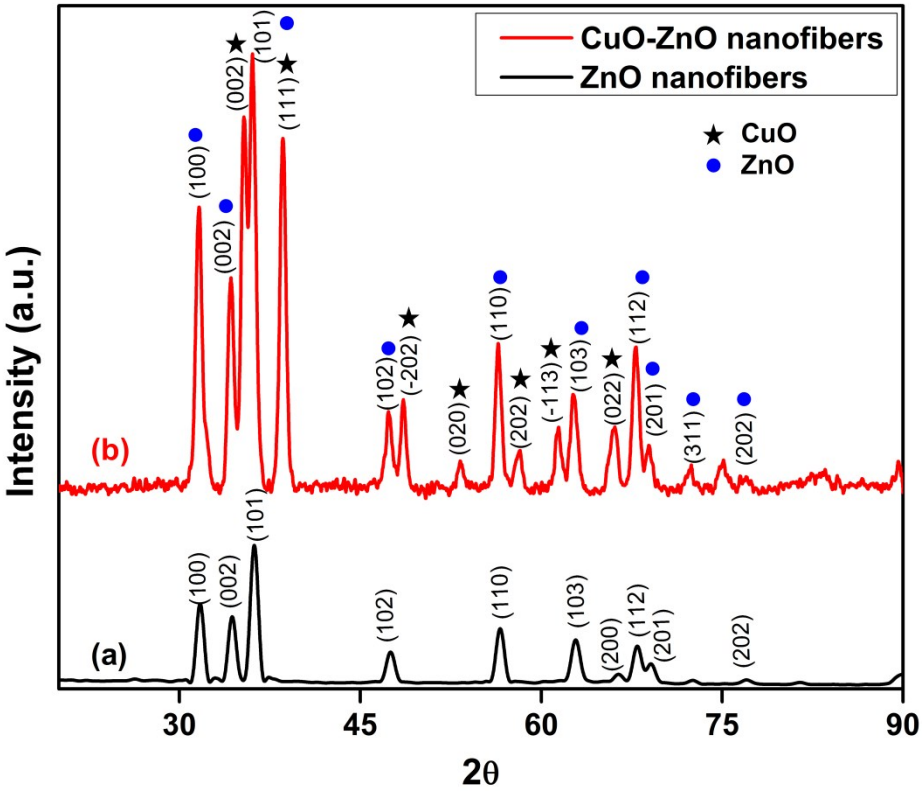

Figure S3 XRD pattern for (a) pure ZnO nanofibers, (b) CuO-ZnO nanofibers representing their characteristic peaks

FTIR Analysis

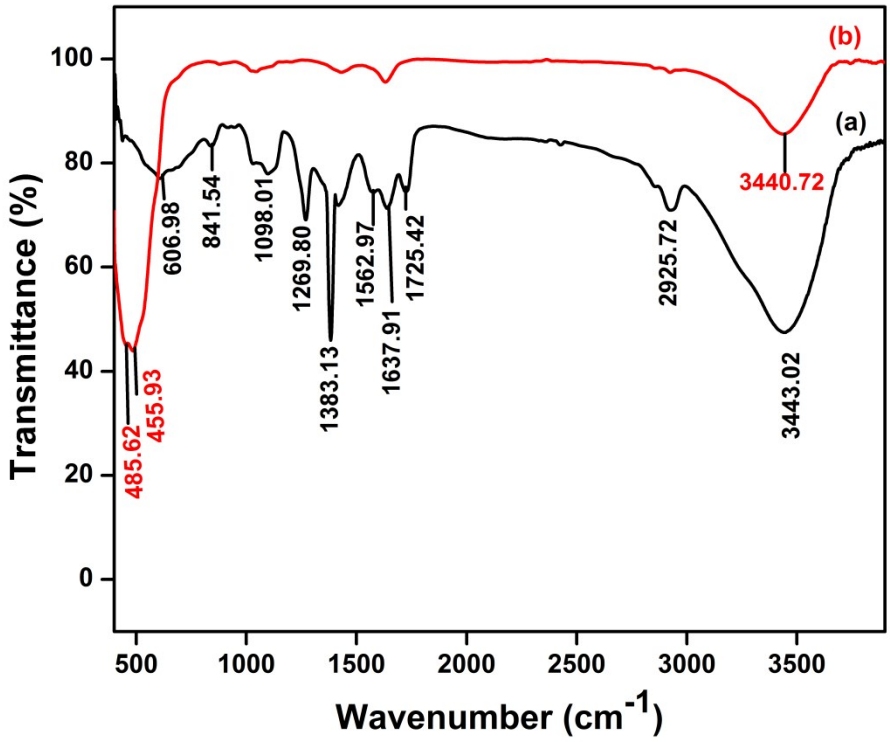

Figure S4 FTIR spectra for (a) electrospun CuAc/ZnAc/PVA nanofibers and (b) calcined CuO-ZnO nanofibers

Fourier Transform Infrared (FTIR) spectrum analysis was carried out to confirm the presence of characteristic vibrational peaks pertaining to CuO-ZnO nanofibers and to analyze the complete removal of the polymer from the composite nanofibers after calcination. Fig. S4 (a) presents the FTIR spectra for precursor composite (CuAc/ZnAc/PVA) nanofibers where the strong absorption peaks at 2952.72, 1725.46, 1637.91,1418.85 and 1098.01 cm^{-1} corresponds well to PVA molecules.[1] The FTIR bands at 841 and 606.98 cm^{-1} were identified as the stretching mode of C-C and Zn-O-Zn, respectively.[2] Besides this, the sharp peak at 1383.13 cm^{-1} belongs to symmetric vibrations of COO^{-}.[3] A broad peak at 3442.01 cm^{-1} is identified as the –OH stretching vibration due to water molecules present over the nanofibers. Interestingly, only few intense peaks left

after calcination at 500˚C as unveiled in Fig. S4 (b). The major peaks appearing at 455.93 and 485.62 cm^{-1} may be assigned to the metal- oxygen (M-O) stretching mode (ν_{Zn-O} and ν_{Cu-O}). Moreover, the peak at 3428.95 is attributed to the H_2O molecules adsorbed onto the surface of nanofibers.[5] Therefore, FTIR spectra clearly explain the almost complete removal of the polymer and other organic components leaving behind the composite CuO-ZnO nanofibers.

Calibration curve of As(III)

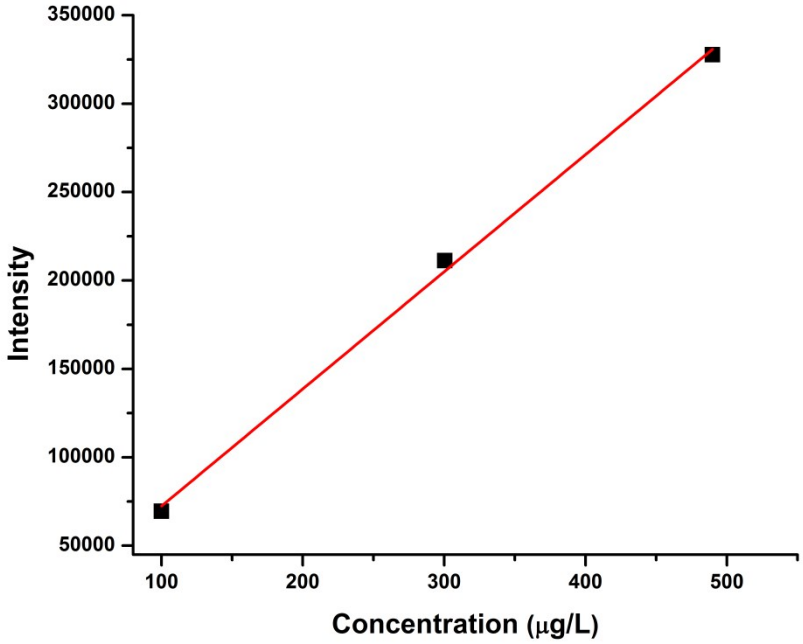

Figure S5 Calibration curve for As(V) used in ICP-MS

S.No	Concentration (ppm)	R_L
1.	1	0.1310
2.	3	0.0478
3.	5	0.02927
4.	7	0.0210
5.	9	0.0165

Table S1 Dimensionless separation factor (R_L) calculated for each concentration

Effect of varying initial concentration of As

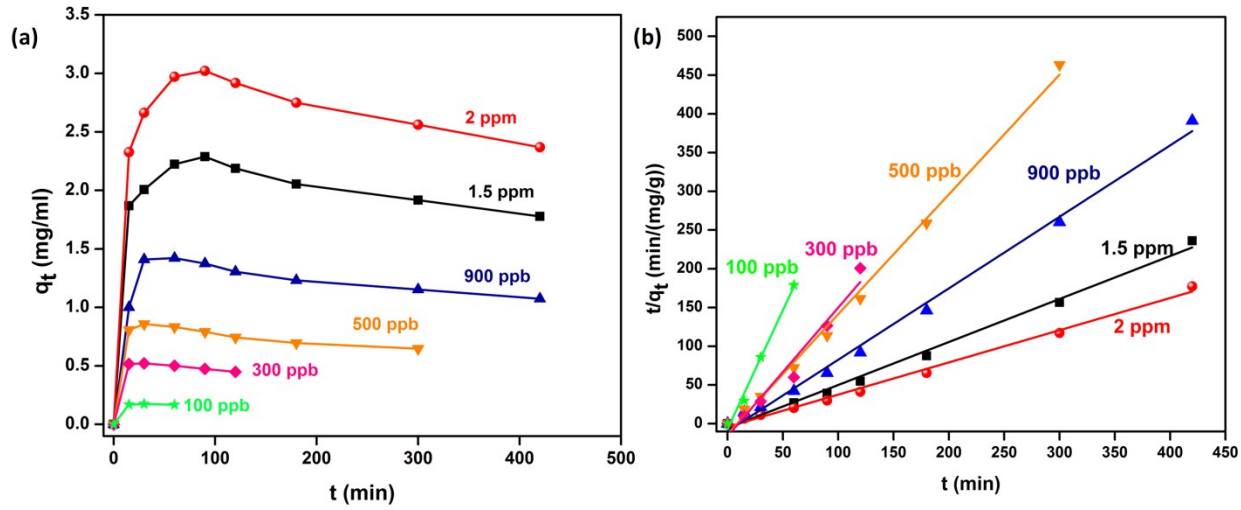

Figure S6 (a) Effect of time on the adsorption of As onto CuO-ZnO nanofibers with different initial concentration of As solution, (b) Kinetics for different concentrations of As.

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