Supplementary Information

**High Surface Area Mesoporous Titanium Zirconium Oxide Nanofibrous Web:**

**A Heavy Metal Ion Adsorbent**

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**Figure S1** Thermogravimetric analysis of (a) Pluronic P123, (b) polyvinylpyrrolidone (1.3M MW), and (c) electrospun nanofiber web (PVP/P123 = 22/78 w/w). Temperature: 30 – 600 °C, ramp rate: 1 °C min⁻¹, under air atmosphere.
Figure S2 Nitrogen sorption isotherms (left) and pore size distributions (right) of TiO$_2$/ZrO$_2$ nanofibrous webs prepared from solutions varying in PVP/P123 ratio.

Figure S3 IR spectra of (a) non-modified TiO$_2$/ZrO$_2$ nanofibrous web, (b) amine-functionalised TiO$_2$/ZrO$_2$ nanofibrous web and (c) phosphonate-functionalised TiO$_2$/ZrO$_2$ nanofibrous web.

It clearly indicates the bonding between the nanofibre surface and phosphonate coupling molecules. While there are no bands in the range for the non-modified TiO$_2$/ZrO$_2$ nanofibrous web, there are broad P-O stretching bands between 950 and 1200 cm$^{-1}$ for the functionalised samples. These are the characteristic bands for M (metal)-O-P and agree well with the literature (see below).

References:
1) 900 – 1200 cm$^{-1}$ (G. Guerrero et al., Chem. Mater. 2001, 13, 4367)
2) 900 – 1300 cm$^{-1}$ (G. Guerrero et al., Chem. Mater. 2000, 12, 1268)
3) 990 – 1250 cm$^{-1}$ (M.A. White et al., J.Am.Chem.Soc. 2006, 128, 11356)