

SUPPLEMENTARY MATERIAL

MICROPOROUS COMPOSITE SiO₂-TiO₂ SPHERES PREPARED VIA THE PEROXO ROUTE: LEAD(II) REMOVAL IN AQUEOUS MEDIA

Roman Morozov¹, Igor Krivtsov^{1,2*}, Viacheslav Avdin¹, Zakariae Amghouz³, Alexander Gorshkov¹, Ekaterina Pushkova¹, Oleg Bol'shakov¹, Aleksandra Bulanova¹, Marina Ilkaeva²

(1) Department of Chemistry, South Ural State University, 454080 Chelyabinsk, Russia.

(2) Departments of Organic and Inorganic Chemistry and Physical and Analytical Chemistry, University of Oviedo-CINN, 33006 Oviedo, Spain.

(3) Department of Materials Science and Metallurgical Engineering, University of Oviedo, Campus Universitario, 33203 Gijón, Spain.

*Corresponding author E-mail: uo247495@uniovi.es; Tel: +34 985 103 00

Table S1. SSA and pore volumes of TiO₂ and SiO₂ samples

Sample name	Apparent BET surface area, m ² /g	T-plot external surface area, m ² /g	Dubinin-Astakhov micropore volume, cm ³ /g	BJH desorption mesopore volume, cm ³ /g
T non-porous[29]	14	14	-	-
T_50	487	290	0.174	0.223
T_400	163	100	0.044	0.261
T_700	56	47	0.014	0.131
SiO ₂	361	148	0.153	-

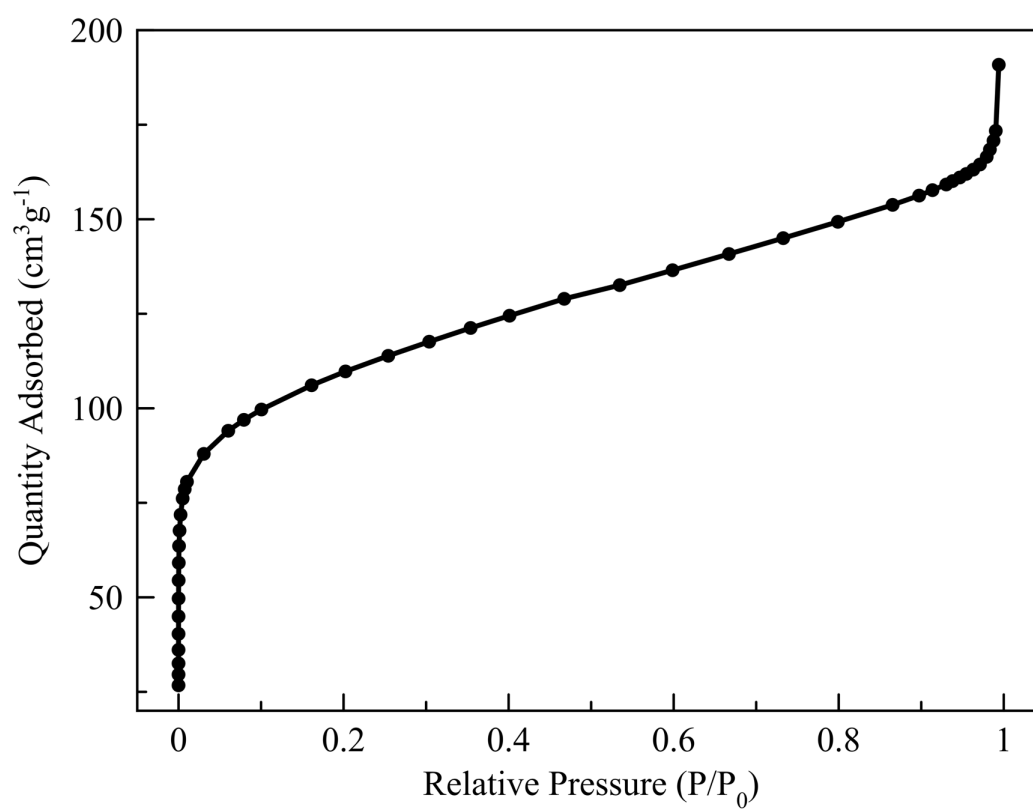


Figure S1. N₂ adsorption-desorption isotherm of porous SiO₂ spheres

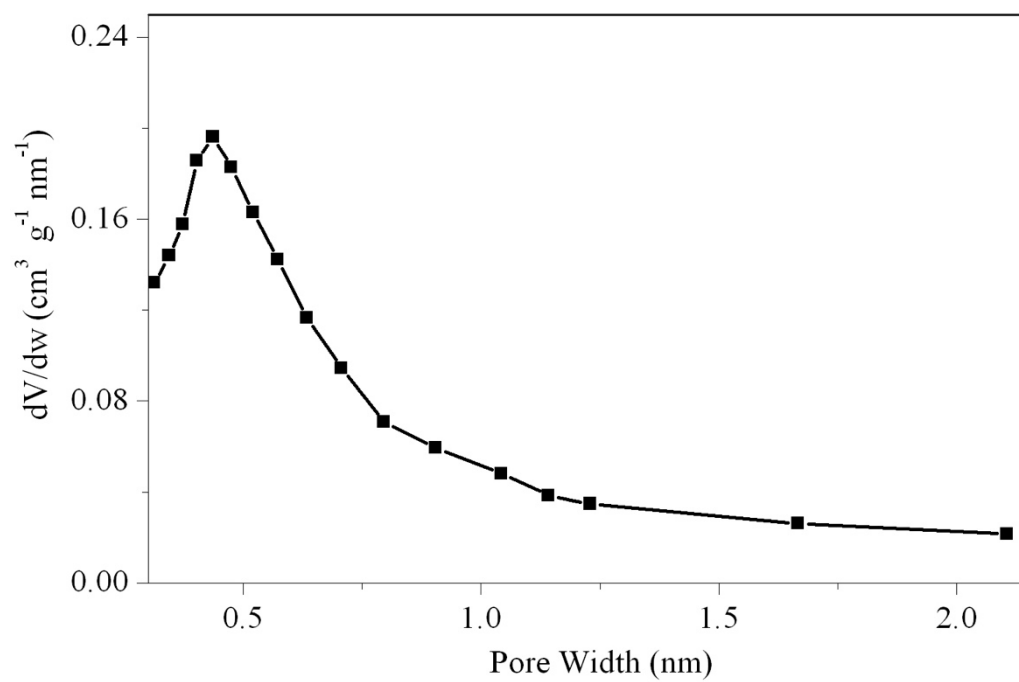


Figure S2. Micropore size distribution of porous SiO₂ spheres

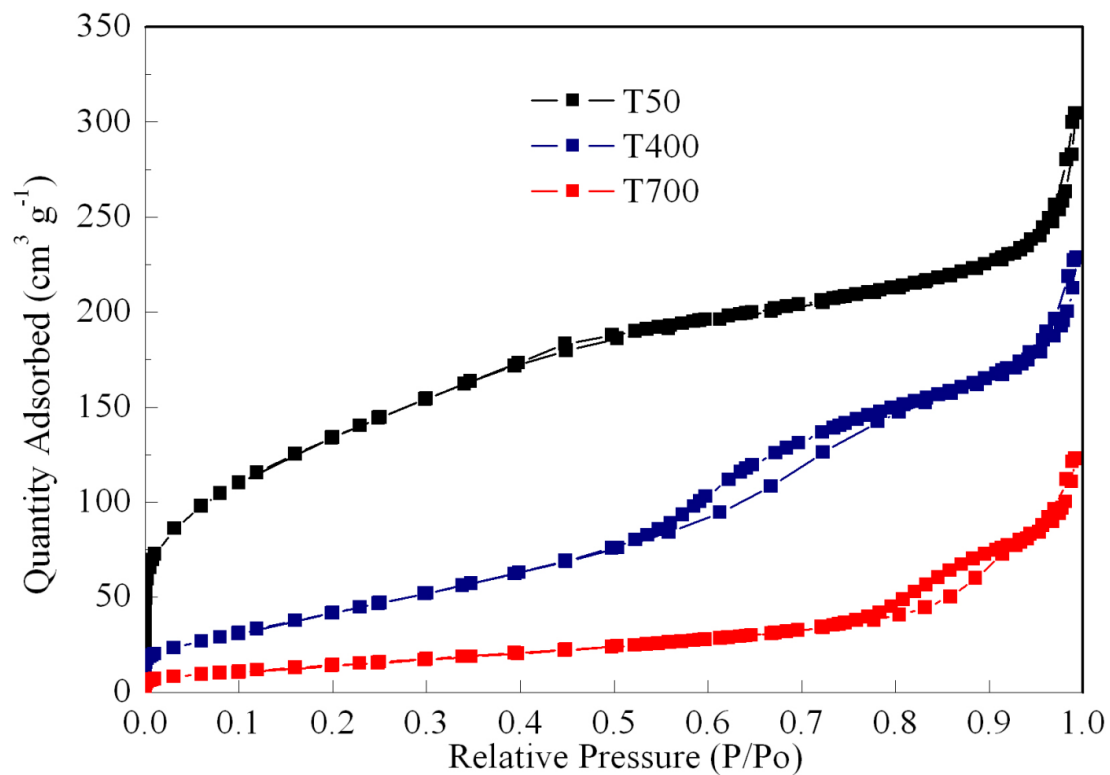


Figure S3. The N₂ adsorption-desorption isotherms of porous TiO₂ spheres

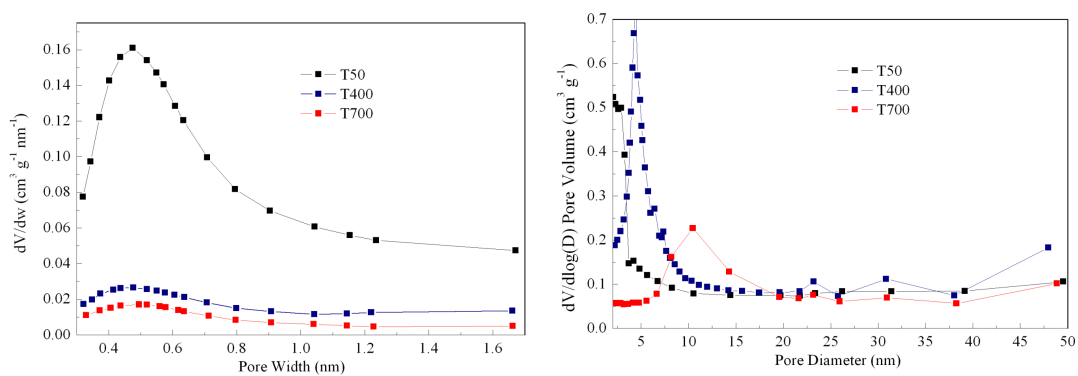


Figure S4. Micropore (Left) and mesopore (Right) size distribution of TiO₂ spheres

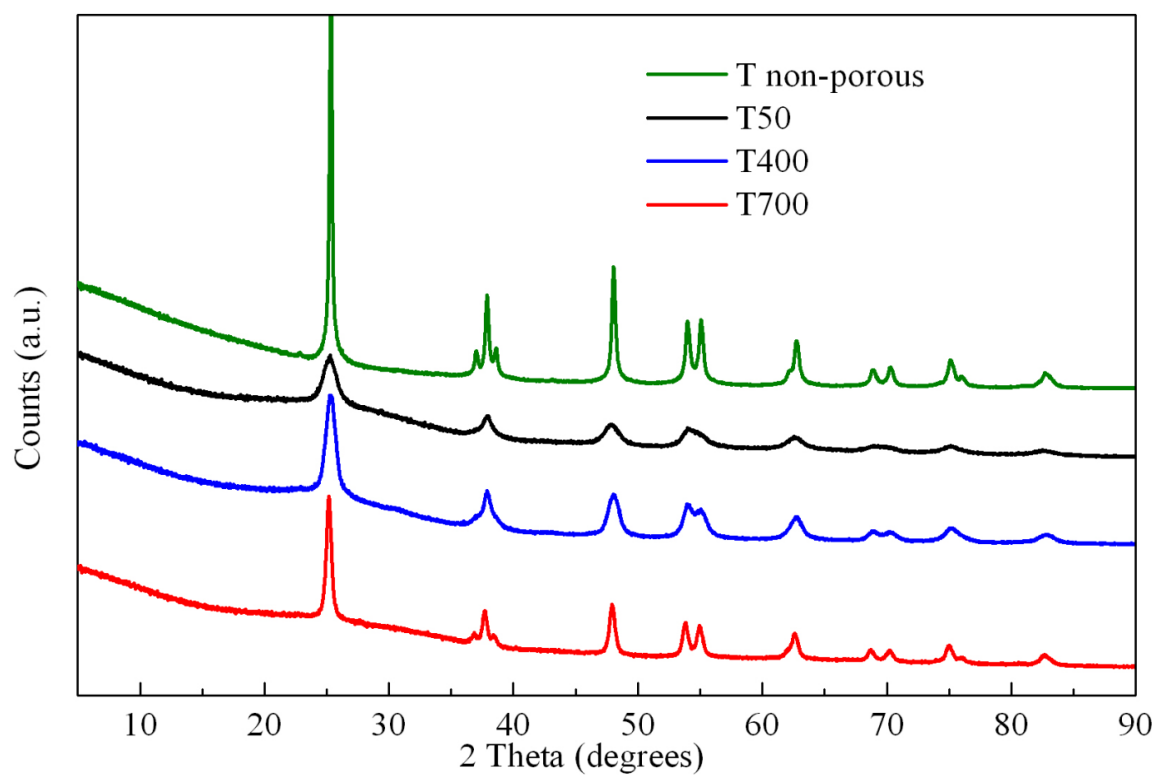


Figure S5. The XRD pattern of TiO₂ spheres

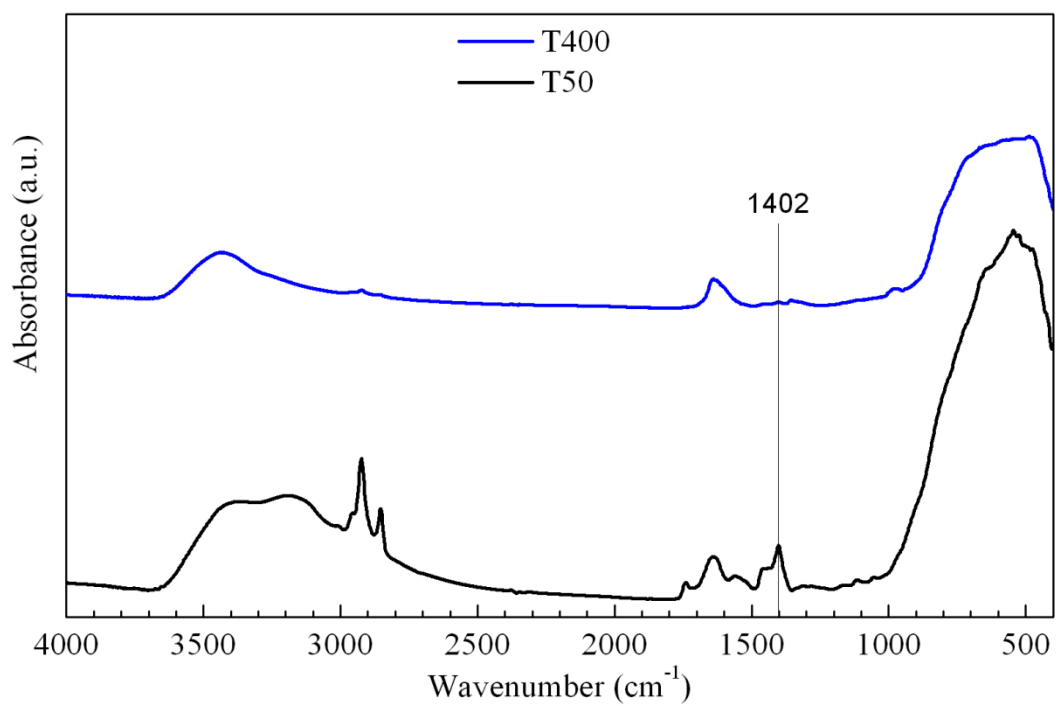


Figure S6. The FTIR pattern of pure TiO₂ spheres

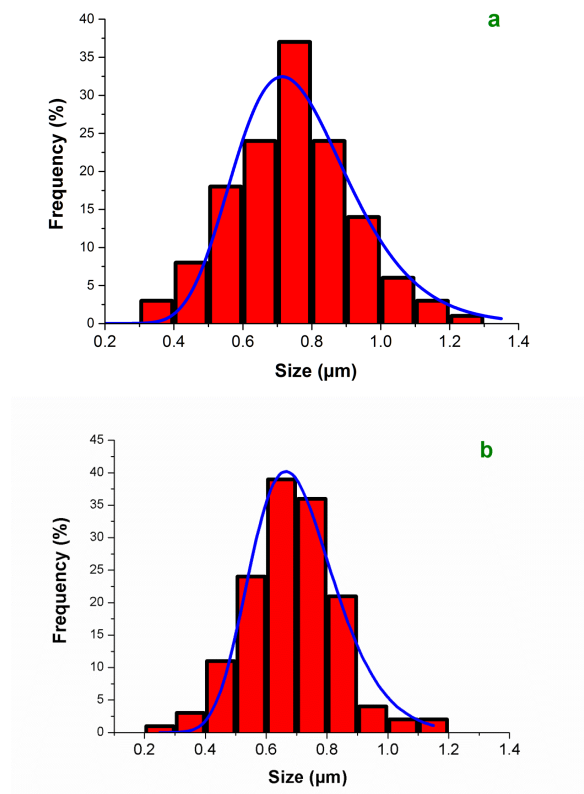


Figure S7. The histogram of particle size distribution for (a) ST50 and (b) ST400 samples

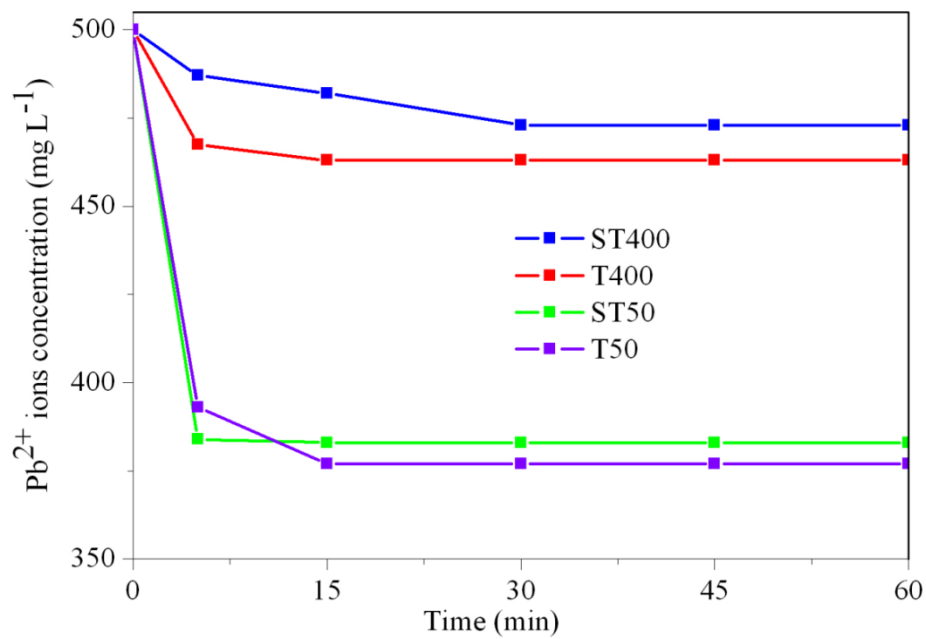


Figure S8. Kinetic study of Pb^{2+} adsorption

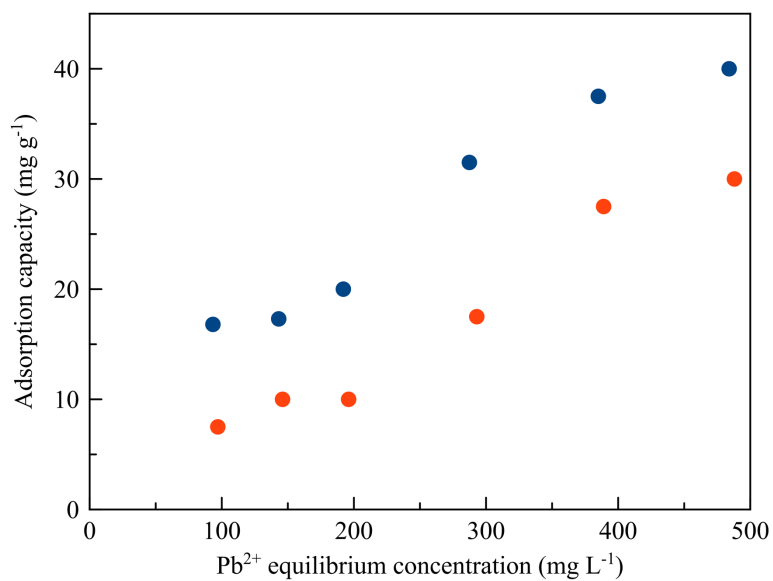


Figure S9. Adsorption of Pb²⁺ the as-prepared SiO₂ (blue) and the SiO₂ calcined at 400 °C (red)

Table S2. Anatase crystal size of TiO₂ materials

Sample name	Anatase crystal size, Å
T non-porous [29]	403
T_50	66
T_400	93
T_700	180

Table S3. Specific adsorption capacity of materials

Sample name	BET surface area, m ² g ⁻¹	Adsorption capacity Q _e , mg g ⁻¹	Specific adsorption capacity, mg m ⁻²
T50	487	323	0.66
T400	163	106	0.65
T700	56	49	0.88
ST50	503	303	0.60
ST400	418	69	0.17
ST700	81	25	0.31