

**Supplementary Table 1:** Analytical results obtained by using Langmuir, D-R, Freundlich and Tempkin isotherm

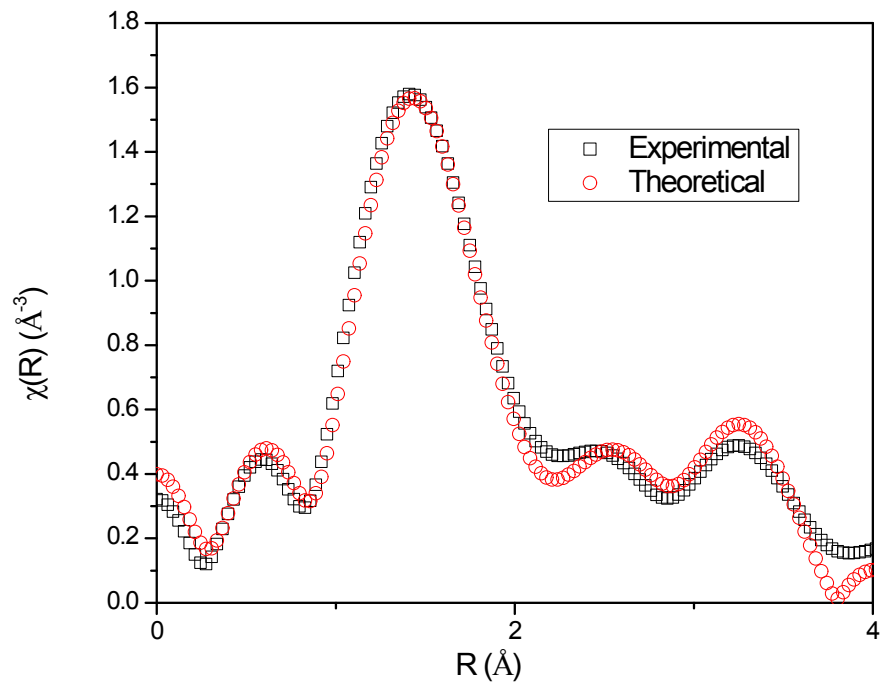
	Langmuir			Dubinin-Radushkevich			Freundlich			Tempkin		
	$q_e$ (mg/g)	$b$ (l/mol)	$\chi^2$	$x_m$ (mg/g)	$E$ (kJ/mol)	$\chi^2$	$K_f$ (mmol/g)	$n$	$\chi^2$	$A_T$ (L/mg)	$b$	$\chi^2$
Am <sup>3+</sup>	67	0.03	0.999	71	11.3	0.987	66	11	0.968	15	37	0.955
Eu <sup>3+</sup>	93	0.04	0.999	89	16.8	0.992	98	10	0.966	13	39	0.932

**Supplementary Table 2:** Analytical results for sorption kinetics using different models

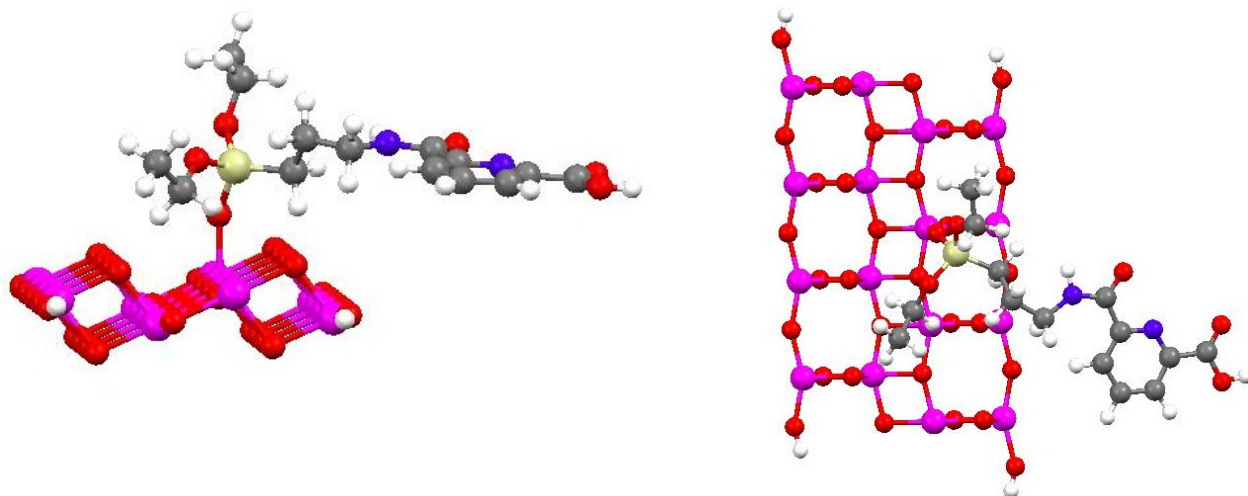
	Lagergren first order kinetics			Intra particle diffusion			Pseudo 2 <sup>nd</sup> order		
	$q_e$	$k_{ads}$	$\chi^2$	$k_p$ (mg g <sup>-1</sup> min <sup>-1</sup> )	$C$	$\chi^2$	$q_e$ (mg g <sup>-1</sup> )	$k_2$ (mg g <sup>-1</sup> min <sup>-1</sup> )	$\chi^2$
Am <sup>3+</sup>	15	0.03	0.904	31	19	0.955	71	6.1E-04	0.999
Eu <sup>3+</sup>	19	0.04	0.935	39	31	0.943	97	8.6E-04	0.999

**Supplementary Table 3:** Bond length, coordination number and disorder factor obtain by EXAFS fitting at Ti K-edge and Eu L3 edge.

Ti K edge			Eu L3 edge		
Path	Parameters	Eu:DPA	Path	Parameters	Eu:DPA
Ti-O	R (Å)	1.88±0.02	Eu-O	R (Å)	2.19±0.01
	N	4.03±0.24		N	2.26±0.27
	$\sigma^2$	0.0036±0.0010		$\sigma^2$	0.0015±0.0010
Ti-Ti	R (Å)	2.83±0.03	Eu-O	R (Å)	2.39±0.02
	N	3.16±0.24		N	7.91±0.98
	$\sigma^2$	0.0014±0.0011		$\sigma^2$	0.0048±0.0017
Ti-Ti	R (Å)	3.58±0.03	Eu-N	R (Å)	3.01±0.04
	N	1.05±0.12		N	4.52±0.56
	$\sigma^2$	0.0014±0.0011		$\sigma^2$	0.0072±0.0013
			Eu-C	R (Å)	3.88±0.05
				N	9.04±1.36
				$\sigma^2$	0.0047±0.0018



**Supplementary Fig. 1:** Fourier transformed EXAFS spectra at Ti K-edge of Anatase  $\text{TiO}_2$



**Supplementary Fig. 2:** Optimized structures of TiO<sub>2</sub>-APTES-DPA molecule