Efficient and selective adsorption of neodymium on expanded vermiculite

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S1: Supplementary Tables

Table S1. Experimental domain of RCCD for the neodymium adsorption on EV.

Factor	Code	Levels				
		-α	-1	0	+1	+α
particle size (mm)	A	0.48	0.65	0.85	1.09	1.30
adsorbent amount (g)	B	0.163	0.300	0.500	0.700	0.836
pH	C	1.3	2.0	3.0	4.0	4.7

Table S2. Comparison of neodymium elution process from different adsorbent matrices.

Adsorbent	*S/L* (g/L)	Regeneration/Elution process	*%D (%)*	LD_{50} (mg/Kg)	GHS class	Reference
Chitosan-Manganese-Ferrite Magnetic Beads	-	Methanol (98% v/v)	90	1,000	Category 4	[1]
Core-shell alginate beads	1	HCl 0.2 M	100	277	Category 3	[2]
Graphene Oxide nanosheets	-	HNO_3 0.1 M	99*	> 90	Category 3	[3]
Gum Arabic grafted polyacrylamide based silica nanocomposite	-	HCl 0.1 M	80	277	Category 3	[4]
Ion imprinted xanthan gum-layered double hydroxide nanocomposite	0.025	HNO_3 0.1 M	-	> 90	Category 3	[5]
Ethylenediaminetriacetic Acid-Functionalized Activated Carbon	-	HCl 0.1 M Washing using acetone and water	99	277	Category 3	[6]
Acrylic Resin (110) resin	0.6	HCl 3.0 M	99.4	277	Category 3	[7]
Expanded Vermiculite	14	$CaCl_2$ 0.5 M	43.2	1,000	Category 4	This work

*From a mixture of rare earth metals

Table S3. Selectivity of neodymium from a multicomponent solution

Metal	*Kd*	*q* (mmol/g)	$S_{Nd/M}$
Ni	0.14	0.058	5.07
Zn	0.08	0.052	8.35
Cu	0.04	0.035	16.26
Pb	0.02	0.017	32.26
Nd	0.71	0.065	-

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