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Supplement of

Mussel shells of *Mytilus edulis* as bioarchives of the rare earth elements and yttrium distribution in seawater and the potential impact of pH and temperature on the partitioning behaviour

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Table 1. Mean concentrations for REY in JLs-1 obtained in this study compared to the published values by Dulski (2001).

Element	Published JLs-1 values (ppm) Dulski (2001)	Mean JLs-1 values (ppm) (This study)
La	0.107	0.0971
Ce	0.187	0.1747
Pr	0.0236	0.0220
Nd	0.0902	0.0837
Sm	0.0185	0.0185
Eu	0.0046	0.0045
Gd	0.0214	0.0220
Tb	0.0031	0.0031
Dy	0.0200	0.0200
Ho	0.0045	0.0043
Er	0.0136	0.0132
Yb	0.0126	0.0117
Lu	0.0020	0.0017
Y	0.2160	0.1992

Table 2. Modelled percentage values of free REY³⁺ species in the North Sea at 5°C Temperature for pH 8.2 and 7.6.

	pH 8.2	pH 7.6
La	8	23
Ce	6	20
Pr	5	17
Nd	4	14
Sm	2	10
Eu	2	9
Gd	2	8
Tb	1	7
Dy	1	6
Ho	1	5
Er	1	4
Tm		
Yb	1	4
Lu	1	3
Y	1	5

Table 3. REY concentrations in ODAS, Jade and Rotersand and North Sea (ppm)

Element	ODAS (Average)	Jade	Rotersand	North Sea seawater
La	0.0127	0.0089	0.0133	2.89 x 10 ⁻⁶
Ce	0.0131	0.0068	0.0119	4.90 x 10 ⁻⁶
Pr	0.0019	0.0015	0.0020	1.05 x 10 ⁻⁶
Nd	0.0080	0.0061	0.0087	2.06 x 10 ⁻⁴
Sm	0.0018	0.0015	0.0020	4.79 x 10 ⁻⁵
Eu	0.0005	0.0004	0.0005	1.17 x 10 ⁻⁵
Gd	0.0028	0.0023	0.0031	7.40 x 10 ⁻⁵
Tb	0.0003	0.0003	0.0004	8.13 x 10 ⁻⁶
Dy	0.0017	0.0014	0.0018	-
Ho	0.0003	0.0003	0.0003	1.14 x 10 ⁻⁵
Er	0.0008	0.0007	0.0007	3.68 x 10 ⁻⁵
Tm	-	-	-	-
Yb	0.0004	0.0003	0.0003	3.49 x 10 ⁻⁵
Lu	0.0001	0.0000	0.0000	5.71 x 10 ⁻⁶
Y	0.015	0.0142	0.0156	2.60 x 10 ⁻⁵

Table 4. Absolute and Apparent Bulk Partition Coefficients of shells and seawater

Element	Absolute (D_{REY})	Apparent Bulk ($D_{REY}^{3+ Free}$)
La	4.14	101.25
Ce	2.31	74.72
Pr	1.86	80.09
Nd	1.79	99.56
Sm	1.56	143.14
Eu	1.36	159.29
Gd	1.20	181.59
Tb	1.03	203.87
Dy	0.76	178.90
Ho	0.57	166.14
Er	0.41	151.11
Tm	-	-
Yb	0.22	117.51
Lu	0.17	140.97
Y	0.61	176.95