Available online at www.sciencedirect.com

ScienceDirect

Ge c a e C c a Ac a 127 (2014) 171 189

Geochimica et Cosmochimica

www.elsevier.com/locate/gca

e e e ec c e caR cea a . He e e e e Nd e (ε

Nd) a d a e ea eR d (REE) e ed a e d dee a e f e d-R de (~40°S) S Pac c aR a e d aR a ec be ed S A e ca a d Ne ZeaR d. T e aR f d a be e e d b a d f a e a e e S Pac c a d d aRa e e aRd f Nd e a a a e a ac e e e f e cea . T e R de a e a b e c e caR c R (ca e ce e e E a e E a aRPac c) a d eRa e f LREE f e ed e cRa R e ce e d b f e d Red REE c ce - a a ce a Rca . Ne e eR , e Nd e a e cRa R ace a e a e cRd AAIW (A a c c e ed a e Wa e) (a e a e $\varepsilon_{Nd} = -8.2$ 0.3), LCDW (L e C c R Dee Wa e) (a e a e $\varepsilon_{Nd} = -8.3$ 0.3), NPDW (N Pac c Dee Wa e) (a e a e $\varepsilon_{Nd} = -5.9$ 0.3), a d e e a f NADW (N A R c Dee Wa e) (a e a e $\varepsilon_{Nd} =$

* C e d a , TeR: +49 431 600 2311.
E-mail address: R a- e c e @ e a .de (M. M R a-Ke c e).

http://dx.doi.org/10.1016/j.gca.2013.11.038

The REE ca be d ded e R REE (LREE) f La S , e M ddle REE (MREE) f E D , a d e Hea REE (HREE) f H L . Y be- a e R H beca e f e c ad (e. . N a , 2001). REE c ce a e a c ea e a e de , a a c e ce f a c ca e face a d ad a e e a a- f a c , ad REE e a e dee e a e . D ed REE f ac a e c e d R e a e c R a a f c f e c ad (e. . B e a d K , 1990). T e LREE a e e a c eac e a d e ef e a e e e d ce e a e HREE , ad d e e ce e REE, a e de . D e e a e a e aR e d e a R e REE c ce a a d a be e REE de e d e c f e a c e aR ce , a e a e a e f a a c a e a e ca e -

c c Ra a e f e ACC (

(CaRa a, 1972). H e e, ede a e f UCDW

ea ed a a Re e a Re a d
a da d d R ed 50 60 b aR d Rca e ea-
e e . S ed Rca e e e c de abR R c ce -
a ed (10 30 b) a d e e e ef e ea ed e
e Red de. T caR aR bea e e f a -
Re a d a da d a ed f 1.5 9 V f d e e ea-
e e e e R Ra e eaR ed b e

Table 2

REE c ce a ( ), E /Nd a , Ce a aRe (Ce/Ce* = 2[Ce]/([La] + [P])) a d GEOTRACES e caRb a ea e d (BATS) f d .

	De ( )	Y ( )	La ( )	Ce ( )	P ( )	Nd ( )	Nd(ID) ( )	S ( )	E ( )	Gd ( )	Tb ( )	D ( )	H ( )	E ( )	T ( )	Yb ( )	L ( )	HREE/LREE (E /Nd)	Ce a aR Ce/Ce*
S a																			
S . 22(SO213-22-2)	300	115	16.9	8.25	2.32	10.7	11.2	1.87	0.45	2.79	0.46	3.43	1.00	3.27	0.54	3.92	0.56	0.29	1.29
39°12′S, 79°55′W	650	107	15.6	5.84	2.36	10.6	10.4	1.71	0.45	2.36	0.43	3.86	1.14	4.02	0.59	4.24	0.71	0.39	0.65
4144 de	1500	148	22.3	6.78	2.87	12.7	12.9	2.16	0.61	3.23	0.55	4.84	1.44	5.36	0.86	5.98	1.14	0.42	0.54
	2600	192	28.6	7.15	3.55	14.3	16.1	2.39	0.79	4.20	0.62	5.77	1.76	6.00	1.08	6.87	1.29	0.37	0.45
	4142	178	33.8	7.74	4.68	21.0	21.0	3.70	0.92	4.94	0.85	6.85	2.00	6.85	1.06	8.02	1.36	0.33	0.40
S . 9(SO213-09-2)	750	110	17.5	7.97	2.60	11.5	11.4	2.05	0.56	2.62	0.48	3.91	1.11	4.03	0.65	4.32	0.80	0.35	0.79
37°41′S, 95°28′W	1500	148	24.1	9.89	3.06	13.1	14.0	2.14	0.61	3.27	0.54	4.54	1.33	5.02	0.84	5.30	1.02	0.36	0.73
3771 de	2200	163	31.1	17.5	4.48	18.3	18.9	3.05	0.73	4.37	0.72	5.71	1.68	6.24	0.97	6.85	1.30	0.33	0.98

f ɤe d d aRREE (Ha ɤ e e aR 2012) de caR ɤe c e aRe e ed b a de FRe d e aR (2012).

2.2.3. Determination of nutrient concentrations

D Red Rca e a d ɤ ɤa e c ce a e e ea ed a ɤe AR ed We e e e B e e ɤa e f R R a da d ced e (G a ɤ e aR 1999).

3. RESULTS

Rcaec ce a eac e a a e b
a e , a e a a a e e e be ee 1500 a d
3500, e e aR f a R 22 1500 (S . 22, 1500 a e

de h . Be ed a a eR 2000 a d 3000 de h, he c ea e he c ce a R ced f - R 22 a d 66. The e a a e e ced b h a d e a aRPac c de ed a e a h de h a e, he e Nd c ce a >30 R a e e ec ed (P e - a a d Jac b e , 1988; A a a a e aR, 2004, 2009). The fac ha he b e ed c ce a a e b 10 15 R R e a d ca e ced ca e ce e he e a aRPac c a d c ed beR (Sec 4.2.1).

3.4. Nd isotope compositions

The Nd e c f he a R a e f −10.3 0.3 −5.4 0.4 ε_{Nd} (F . 5, TabR 1). e - ed a e a e , he d a f AAIW a d ec SAMW (300 1500 de h) h a a e f ε_{Nd}

The ac f he a a e a e (LCDW a d

−9.0 0.3 (M C-78) a d −10.3 0.3 (M C-79) e ec e ad ec f e d a NADW. T e d e e ce f 1.3 ε_{Nd} be ee e e a a e f a e f ac f a e a e e a e ca f a M C-79, a fe ed f e e a e ε_{Nd} a e, a e a e e c ce a a d e a (ee Table 1 a d F . 11e,f a d 2b,c).

F . 6 d ca e a a M C-79 (ε_{Nd} = −10.25, [Nd] = 21.8), fa e e f LCDW a d NADW, d ca f a d 50% f e a e a e a 3100 , 179°E, 45°S. M - f LCDW a d NADW e e a e

4.4. Sediment–bottom water interactions

4.4.1. Release of REEs from the sediments of the Southeast Pacific Basin

d a ea e R e a f ed e a f REE ca be f d e b a e f e S -ea Pac c ba e e a 9 3769 e e LREE c ce a (e. . [Nd] = 39.1)(F . 3). W a c de ab d ca f e Nd e c (−

f e e d-Ra de S Pac c, e aRc e
eRab R f Nd e a a e a ace e .
Va a e e aRR cc c e de ce c a e

Ge a C. R., Ma a a T., G ea e M. J., ER e eR H. a d
Ed d J. (1995) D Red a e ea he R e ae S ae

R[illegible]be[illegible] N. L., P[illegible] A. M., McMa[illegible] J. F. [illegible]d Ke[illegible] L. D. (2010) S[illegible] [illegible]. Science 327, 75.

Sa[illegible] J. L., S[illegible] J., G[illegible] A., G[illegible]be[illegible] N., Ke[illegible] R. M. [illegible]d Sc[illegible] R. (2007) Dee[illegible] cea[illegible] [illegible]. Global Biogeochem. Cycles 21. [illegible]://d[illegible].d[illegible]/10.1029/2006GB002720.

Sc[illegible] H. D. [illegible]d Ma[illegible] E. E. (2004) [illegible]. Earth Planet. Sci. Lett. 228, 391 405.

S[illegible] G., H[illegible] S., P[illegible] O. [illegible]d Ra[illegible] M. (2004) [illegible]. Deep-Sea Res. I 51, 1367 1386.

S[illegible] M., K[illegible] S., [illegible] T., J[illegible] K., [illegible] S. L., He[illegible] S. [illegible] R. F. (2008) [illegible] Nd [illegible]. Earth Planet. Sci. Lett. 274, 448 461.

S[illegible] S. P., S[illegible] S. K., G[illegible] V., B[illegible] R. [illegible]d Ra[illegible] V. K. (2012) [illegible] ε_{Nd} [illegible]. Geochim. Cosmochim. Acta 94, 38 56.

S[illegible] B. M. [illegible] S. R. (2001) [illegible]. J. Phys. Oceanogr. 31, 1005 1030.

S[illegible] T., F[illegible] M., R[illegible] J. [illegible]d Ha[illegible] B. A. (2012) [illegible]. Earth Planet. Sci. Lett. 317–318, 282 294.

S[illegible] H. [illegible]d A[illegible] A. B. (1960) [illegible]. Deep-Sea Res. 6, 140 154.

S[illegible] H., D[illegible] S[illegible] E., Re[illegible]d J. L. [illegible]d Wa[illegible] B. (1973) [illegible] 43°S [illegible]d 28°S: [illegible] SCORPIO [illegible]. Deep-Sea Res. 20, 1 7.

Tac[illegible] K., A[illegible] V. [illegible]d Jea[illegible] C. (2003) [illegible]. J. Geoph. Res. 108 (C8).

Ta[illegible] T., T[illegible] S., Ka[illegible] H., A[illegible] H., Ka[illegible] H., Ha[illegible] T., Y[illegible] M., O[illegible] Y., Y[illegible] S., S[illegible] H., K[illegible] T., Ta[illegible] K., Y[illegible] T., Na[illegible] T., F[illegible] H., S[illegible] R., A[illegible] Y., Ta[illegible] M. [illegible]d D[illegible] C. (2000) JNd[illegible]-1: [illegible]. Chem. Geol. 168, 279 281.

T[illegible] S. R., McLe[illegible] S. M. 1985. [illegible].