Plio-Pleistocene evolution of water mass exchange and erosional input at the Atlantic-Arctic gatewa

Claudia Teschner[1,2], Martin Frank[1], Brian A. Haley[3], and Jochen Knies[4,5]

[1] [2]
[3]
[4] [5]

Abstract

( ), ( ), ( ) 911 (151) 906 5.2 . . ε −11.0 0.2. 2.7 2.7 2.7 ( )

1. Introduction

( ) ( ).

( ) Broecker et al., 1985; Rahmstorf, 2002; Kuhlbrodt et al., 2007.

Imbrie et al., 1993; de Menocal et al., 1992; Boyle, 1988; Böhm et al., 2015.

., Knies et al., 2007; Brinkhuis et al., 2006; Peltier et al., 2006; Clark et al., 2002; Ganopolski and Rahmstorf, 2001. " ". Peterson et al., 2006, Böhm et al

- ( ) 45 Moran et al., 2006
38 30 Eldrett et al., 2007,
Wolf-Welling et al., 1995; Wolf and Thiede, 1991; Jansen and Sjøholm, 1991. 3.3 -
Jansen et al.,
2000; Kleiven et al., 2002; Knies et al., 2014.
2–3
De Schepper et al., 2013. 3.29 2.97
Dowsett et al., 2012, 2013
6 (2.72) . ., Knies et al., 2014, 2014 ; Kleiven et al., 2002; Jansen et al.,
2000; Fronval and Jansen, 1996.

Roberts et al., 2010, 2012; Piotrowski et al., 2012; Kraft et al., 2013; Tachikawa et al., 2014.

( ) 50 Schaule and Patterson, 1981; Erel et al., 1994 Frank, 2002; Gutjahr et al., 2009; Crocket et al., 2013; Wilson et al., 2015. α-

., Jeandel et al., 1998; Lacan and Jeandel, 2005; Wilson et al., 2013, 2015.

Lacan and Jeandel, 2004, 2005,

Arsouze et al., 2009; Rempfer et al., 2011.

Andersson et al., 2008; Porcelli et al., 2009.

Eisenhauer et al., 1999; Haley et al., 2008

Andersson et al., 2008; Porcelli et al

( ) 6 .

^{87}/^{86} ^{206}/^{204} ε

1.7 .

( ),

, Dausmann et al. 2015,

4 .

Haley et al. 2008, 2008 Chen et al. 2012

Bayon et al. 2002 Gutjahr et al. 2007 15 .

/ .

.., Aagaard et al., 1985,

Haley et al., 2008 .

79 Maccali et al., 2012.

, Werner et al. 2014

8500 .

.

5.2

.

2. Material and Methods

911 (151) 906 (80 28.466′, 08 13.640′)

Knies et al., 2002, 2009, Knies et al. 2009

<2.7

2.7 911

Knies et al. 2014, 2014 Mattingsdal et al. 2014,

Grøsfjeld et al. 2014. , 12

(2),

.

.3291TD[370.8(m92.natures)-412.a2.natuf5.0709et)-34.612.a8(st)-33s-315(h1past)ctedleach204(P19esul203(a(the4-196(det

^{87} / ^{86}

5.2 , Gutjahr et al., 2007 .

12 Haley et al. 2008 . 3 , ^{3} + 180 3 . ^{3} + $_4$ 190 .

50 µ 1-28 (100–200) Lugmair and Galer 1992 . ( ) 0.8 50 212 (200–400) Barrat et al., 1996 . 50 µ (50–100) Horwitz et al. 1992 Bayon et al. 2002 2 (50–100) Le Fèvre and Pin, 2005 .

Nu Plasma 0.7219 ^{146} / ^{144} , ^{143} / ^{144} -1 0.512115 Tanaka et al., 2000 . -1 0.3 ε (2σ; n = 120) 16 . ≤80 , ^{86} / ^{88} = 0.1194 Steiger and Jäger, 1977 ^{86} ^{87} . ^{87} / ^{86} = 0.710245 ( ) ( )987 , 0.000032 (2σ; n = 70) 1 . 2 . Albarède et al. 2004 , 981 ^{206} / ^{204} = 16.9405, ^{207} / ^{204} = 15.4963, ^{208} / ^{204} = 36.7219 Abouchami et al., 1999 . (2σ; = 88) 1 0.008 ^{206} / ^{204} , 0.009 ^{207} / ^{204} , 0.033 ^{208} / ^{204} , 0.0009 ^{208} / ^{206} , 0.0002 ^{207} / ^{206} . ≤1.45 .

3. Results

3.1. Neodymium and Strontium Isotopic Signatures of Leachates and the Detrital Sediment Fraction

ε −6.9 −12.1 (2). (0–3) −11.0 Lacan and Jeandel, 2004 ; Andersson et al., 2008 (3). ε 2.7 ( ). 2.7 ε −8.5 −11.5 (ε −10.4 3 ε), 2.7 ε 5.2 ε −6.9 −12.1. ε −11.5, (2).

., 2007, 2008; . .,

Andersson et al., 2008 (3). ., Henrich et al., 2002. Ganopolski and Rahmstorf 2001

/ (5.2–3.6), -
3.9 25 Belt and Müller, 2013; Knies et al., 2014 .
ε 911 ,
5.2 4.8
8 2 Haley et al., 2008 . ,
25 3.0 Knies et al., 2014 (3).

3.3 2.7 -
3.29 2.97 Dowsett et al., 2012, 2013
ε

911

Burton et al., 1999; Reynolds et al., 1999

1.7 Winter et al., 1997

1 Haley et al., 2008 ; Reynolds et al

[illegible] 2.7 [illegible] 2.7 [illegible] 2.0 [illegible] 2.7 [illegible]

References

[illegible] (1985), [illegible], J. Geophys. Res., 90, 4833–4846, :10.1029/ 090 03 04833.

[illegible] (1999), [illegible], Geochim. Cosmochim. Acta, 63, 1489–1505.

[illegible] (2004), [illegible], Geochim. Cosmochim. Acta, 68, 2725–2744.

[illegible] (2008), [illegible], Geochim. Cosmochim. Acta, 72, 2854–2867.

[illegible] (2009), [illegible], Biogeosciences, 6, 2829–2846.

[illegible] (1996), [illegible]

[illegible] (2007), [illegible], Nature, 446, 176–179.

[illegible] (2011), [illegible], Geochem. Geophys. Geosyst., 12, [illegible]09008, [illegible]:10.1029/2011[illegible]003741.

[illegible] (1994), [illegible], Geochim. Cosmochim. Acta, 58, 5299–5306.

[illegible] (2003), [illegible], Earth Planet. Sci. Lett., 209, 227–243.

[illegible] (2006), [illegible], Nature, 444, 918–921.

(2014), , Mar. Geol., 357, 182–194.

(2002), (3.5-2.4)— -, Palaeogeogr. Palaeoclimatol. Palaeoecol., 184, 213–223.

(2002), " - (3) " (3–1.7), Boreas, 31, 82–93.