Fossil black smoker yields oxygen isotopic composition of Neoproterozoic seawater

F. Hodel*[1,2], M. Macouin[1], R.I.F. Trindade[2], A. Triantafyllou[3], J. Ganne[1], V. Chavagnac[1], J. Berger[1], M. Rospabé[1], C. Destrigneville[1], J. Carlut[4], N. Ennih[5], P. Agrinier[4]

[1] Géosciences Environnement Toulouse (GET), Observatoire Midi Pyrénées, Université de Toulouse, CNRS, IRD, UPS, 31400 Toulouse, France

[2] Departamento de Geofísica, Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, 05508-090 São Paulo, Brazil

[3] Laboratoire de Planétologie et Géodynamique, UMR-CNRS 6112, Université de Nantes, 44322 Nantes, France

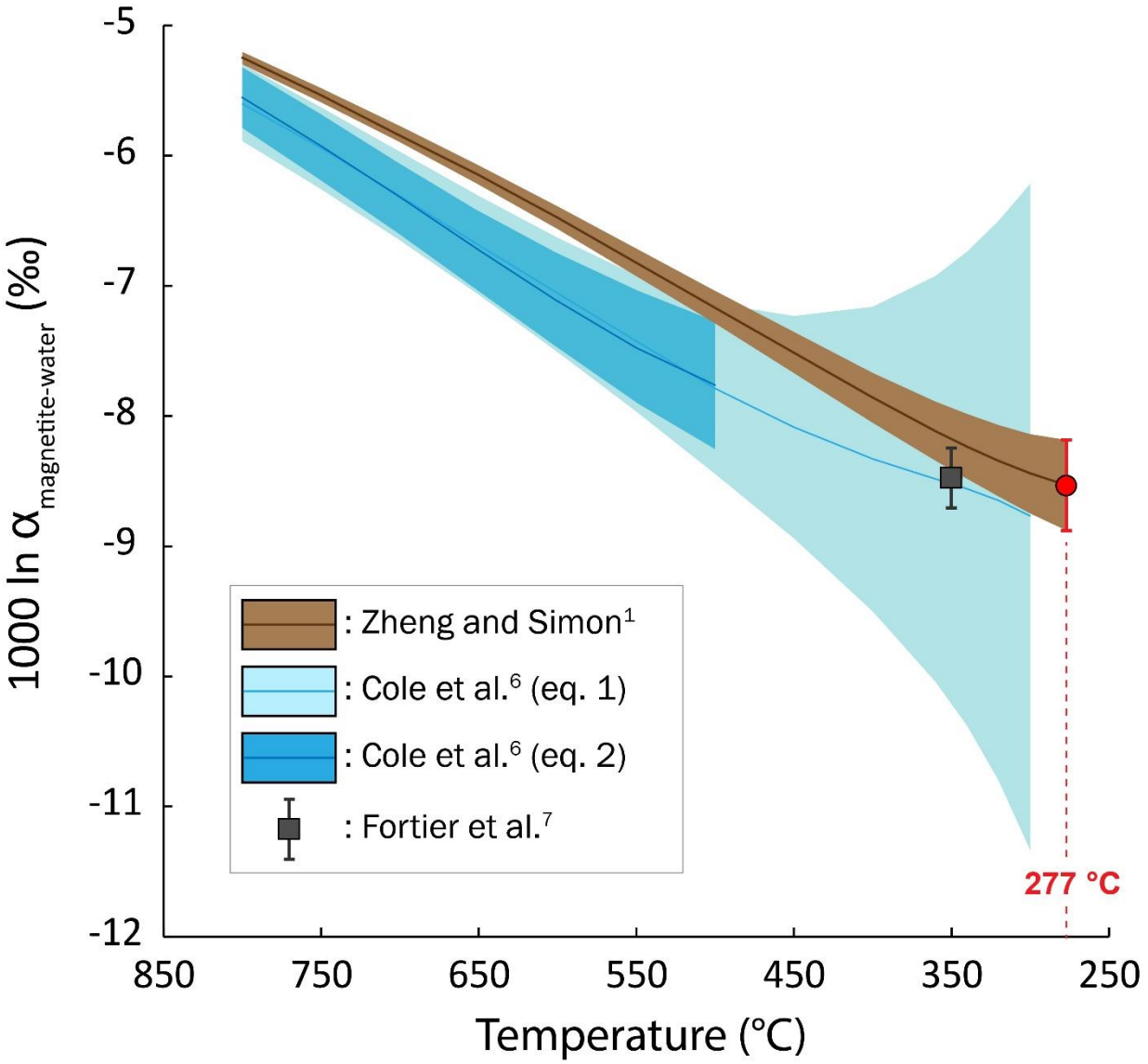
[4] Institut de Physique du Globe de Paris, Université Sorbonne Paris Cité, Université Paris Diderot, CNRS, UMR 7154, 75005 Paris, France

[5] EGGPG, Département de Géologie, Faculté des Sciences, Université Chouaib Doukkali, 24000 El Jadida, Morocco

Correspondence to: F. Hodel, florent.hodel@hotmail.fr

Fract. Law (Zheng and Simon, 1991, Eur. J. Mineral.)[1]		
$1000\ln\alpha_{mt\text{-}w}=3.02 \times 10^6 / T^2 -12.00 \times 10^3 / T + 3.31$		
T (°C)		**277**
T (K)		**550.15**
Error On T		**10**
$1000\ln\alpha_{mt\text{-}w}$		**-8.52**
Error on fractionation		**0.36**
Sample	**$\delta^{18}O$ magnetite**	**$\delta^{18}O$ fluid**
AA01	-8.96	
AA37F	-8.16	
AA37S	-9.33	
AA47	-9.27	
AA57	-9.02	
Mean	**-8.95**	**-0.42**
Std. Deviation (σ)	0.47	
2σ	**0.93**	
Std. Error	0.21	
2 Std. Error	**0.42**	
Error on fluid		**0.55**
Hydrothermal fluid to seawater shift (from compilation of 120 current black smokers)		
Mean $\Delta^{18}O_{BSfluid\text{-}PDseawater}$	**2σ**	
0.91	**0.81**	
Jean-Baptsite et al. 1997. (Geochimica et Cosmochimica Acta)[2]		
Bach and Humphris, 1999. (Geology)[3]		
Reeves et al. 2011. (Geochimica et Cosmochimica Acta)[4]		
James et al. 2014. (Geochimica et Cosmochimica Acta)[5]		
At 277 +/- 10 °C		
$\delta^{18}O$ NEOPROT. BOTTOM SEAWATER		
-1.33	**(+/-)**	**0.98**

Supplementary Table 1: Isotopic data and calculations.



Supplementary Figure 1: Water-magnetite fractionation law selection. Graphical representation of water-magnetite fractionation factor as a function of temperature for the laws of Zheng and Simon[1] and Cole et al.[6] compared with the measured value of Fortier et al.[7]. Uncertainties were calculated for an uncertainty of 10 °C on the temperature. The uncertainty for the unique value at 350 ° C given by Fortier et al.[7] is specified in their study (±0.23‰).

Supplementary References

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