

Table S6. Sulfur and lead isotopic compositions of the sulfide minerals in sample H4-TVG5-1-1 from the NHF determined via LA-MC-ICP-MS and the formation temperature of coexisting sphalerite and galena.

<i>Sulfur isotopic compositions of sulfide minerals</i>											
Points	Minerals	$\delta^{34}\text{S}_{\text{v-CDT}}$ (‰)	2SE	1000ln α	Fractionation factors	Temperature (°C)					
8-9-3*	Sphalerite	5.69	0.33	2.12	$A=0.73$	314					
8-9-5*	Galena	3.58	0.45		$A^*=0.74$	318					
15-1	Pyrrhotite	4.13	0.44								
15-2	Pyrrhotite	3.70	0.40								
15-3	Pyrrhotite	3.72	0.36								
<i>Standard material</i>											
PSPT-3	Sphalerite	26.36	0.29								
<i>Lead isotopic compositions of sulfide minerals</i>											
Points	Minerals	$^{208}\text{Pb}/^{204}\text{Pb}$	SE	$^{207}\text{Pb}/^{204}\text{Pb}$	SE	$^{206}\text{Pb}/^{204}\text{Pb}$	SE	$^{208}\text{Pb}/^{206}\text{Pb}$	SE	$^{207}\text{Pb}/^{206}\text{Pb}$	SE
8-9-1	Galena	38.765	0.008	15.633	0.003	18.536	0.003	2.0911	0.0001	0.8434	0.00002
8-9-2	Galena	38.770	0.007	15.636	0.003	18.537	0.003	2.0911	0.0001	0.8434	0.00003
8-9-5	Galena	38.742	0.010	15.628	0.004	18.530	0.004	2.0908	0.0001	0.8434	0.00004
1-1	Galena	38.738	0.007	15.626	0.002	18.528	0.003	2.0909	0.0001	0.8434	0.00003
1-2	Galena	38.745	0.008	15.629	0.003	18.528	0.003	2.0911	0.0001	0.8434	0.00003
2-1	Galena	38.766	0.007	15.634	0.003	18.538	0.003	2.0911	0.0001	0.8434	0.00002
2-2	Galena	38.750	0.008	15.629	0.003	18.534	0.003	2.0907	0.0001	0.8433	0.00003
3-1	Galena	38.745	0.007	15.628	0.003	18.531	0.003	2.0907	0.0001	0.8433	0.00002
3-2	Galena	38.746	0.007	15.629	0.003	18.534	0.003	2.0906	0.0001	0.8433	0.00003
<i>Standard materials</i>											
gn-std		38.165	0.005	15.620	0.002	17.964	0.002	2.1246	0.0001	0.8696	0.00002
gn-std		38.162	0.006	15.620	0.002	17.962	0.002	2.1246	0.0001	0.8696	0.00002
gn-std		38.159	0.007	15.618	0.003	17.961	0.002	2.1246	0.0001	0.8695	0.00003

gn-std	38.166	0.007	15.622	0.003	17.962	0.003	2.1247	0.0001	0.8696	0.00003
gn-std	38.173	0.006	15.625	0.002	17.966	0.002	2.1248	0.0001	0.8697	0.00003

Sulfur isotopic compositions of coexisting sulfide mineral phases (Point 8-9-3 sphalerite and Point 8-9-5 galena) in the seafloor hydrothermal sulfide samples from the NHF, and corresponding temperature (°C) calculated by geothermometer based on the equilibrium sulfur isotope fractionation factors ($A = 0.73$) of sulfides with respect to H₂S (after Ohmoto and Rye, 1979), and the equilibrium sulfur isotope fractionation factors ($A^ = 0.74$) of sulfides without the Madelung constant (after Li and Liu, 2006). Equation of sulfur isotope geothermometer is: $1000 \ln \alpha = (A \times 10^6) / T^2$, and $1000 \ln \alpha = (A^* \times 10^6) / T^2$.