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Supporting Information for

**Anhydrite-assisted hydrothermal metal transport to the ocean floor – insights from thermo-hydro-chemical modeling**

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Movie S1

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**Additional Supporting Information (Files uploaded separately)**

Caption for Movie S1

Thermodynamic data table

**Introduction**

The movie S1, complementing Figure 6 in the manuscript, shows the evolution of the chimney-like structure and vent temperature. The evolution movie plots vent temperature, saturation of anhydrite and pyrite from 5 to 5000 years with 5 years interval. It was generated by python and matplotlib in mp4 format and with 600 dpi.

We have augmented the Supcrt92 equation-of-state with a number of additional aqueous and mineral species. Those are listed in S\_Table 1 along with the corresponding references.

Movie S1 (Movie1.mp4). Evolution of Chimney-like structure (saturation of anhydrite and pyrite) and maximum vent temperature of model kext=4×10-14 m2 (corresponding to Figure 6 in the manuscript). Two color scales on the right side represent saturation of anhydrite and pyrite respectively, and a color scale inside the axes box shows the vent temperature evolution. A triangle on the top with dynamic color indicating the temperature denotes the horizontal position of vent.

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| **S\_Table 1** List of aqueous and mineral species used in addition to the SUPCRT database. |
|
|   | Species | References |
| Aqueous species |  |
|  | Ag(HS)° | [*Akinfiev and Zotov*, 2001] |
|  | Ag(HS)2- | [*Akinfiev and Zotov*, 2001] |
|  | AgCl° | [*Akinfiev and Zotov*, 2001] |
|  | AgCl2- | [*Akinfiev and Zotov*, 2001] |
|  | AgOH | [*Akinfiev and Zotov*, 2001] |
|  | Ag(OH)2- | [*Akinfiev and Zotov*, 2001] |
|  |  |  |
|  | Au(HS)° | [*Akinfiev and Zotov*, 2010] |
|  | Au(HS)2- | [*Akinfiev and Zotov*, 2010] |
|  | AuCl° | [*Pokrovski et al.*, 2014] |
|  | AuCl2- | [*Pokrovski et al.*, 2014] |
|  | AuOH° | [*Pokrovski et al.*, 2014] |
|  | Au(OH)2- | [*Pokrovski et al.*, 2014] |
|  |  |  |
|  | Cu(HS)° | [*Akinfiev and Zotov*, 2010] |
|  | Cu(HS)2- | [*Akinfiev and Zotov*, 2010] |
|  | CuOH | [*Akinfiev and Zotov*, 2001] |
|  | Cu(OH)2- | [*Akinfiev and Zotov*, 2001] |
|  |  |  |
|  | Zn(HS)2° | [*Akinfiev and Tagirov*, 2014] |
|  | Zn(HS)3- | [*Akinfiev and Tagirov*, 2014] |
|  | ZnCl2° | [*Akinfiev and Tagirov*, 2014] |
|  | ZnCl3- | [*Akinfiev and Tagirov*, 2014] |
|  | ZnCl4- | [*Akinfiev and Tagirov*, 2014] |
|  | Zn(OH)+ | [*Akinfiev and Tagirov*, 2014] |
|  |  |  |
|  | As(OH)3° | [*Perfetti et al.*, 2008] |
|  | AsO(OH)3° | [*Perfetti et al.*, 2008] |
|  |  |  |
| Mineral species |  |
|  | Tennantite-(Fe) | [*Seal et al.*, 1990] |
|  | Tennantite-(Zn) | [*Seal et al.*, 1990] |
|  | Tetrahedrite-(Fe) | [*Seal et al.*, 1990] |
|  | Tetrahedrite-(Zn) | [*Seal et al.*, 1990] |
|  | Arsenopyrite | [*Perfetti et al.*, 2008] |

**Additional references**

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