

Table 2 Mineral S isotope data and calculated fluid H<sub>2</sub>S composition

Samples	Description	S isotope values								
Porphyry mineralization Stage 1		Chalcopyrite		Pyrite						
		$\delta^{34}\text{S}_{\text{Ccp}}$	$\delta^{34}\text{S}_{\text{H}_2\text{S}}$	$\delta^{34}\text{S}_{\text{Py}}$	$\delta^{34}\text{S}_{\text{H}_2\text{S}}$					
		3204-1066	Qz-Ccp-Py vein	-2.6	-2.7	-4.4	-5.4			
				-2.4	-2.5					
		-0.7	-0.8							
2404-903	Qz-Ccp-Bn-Py vein, Ccp-Bn replacing Py			-1.6	-2.6					
				-0.8	-1.8					
				-0.2	-1.2					
				0.9	-0.1					
2404-720	Disseminated Ccp-Bn repacing Py			-5.8	-6.8					
				-0.5	-1.5					
Porphyry mineralization Stage 2										
2404-720	Disseminated Ccp-Bn repacing Py	-8.7	-9.7							
		-6.7	-7.7							
		-3.2	-4.2							
2404-903	Qz-Ccp-Bn-Py vein, Ccp-Bn replacing Py	-3.3	-3.4							
		-3	-3.1							
Epithermal mineralization (Stage 4-6)		Stage 4 (pyrite)		Stage 5 (chalcopyrite)		Stage 6 (enargite)				
		$\delta^{34}\text{S}_{\text{Alu}}$	$\delta^{34}\text{S}_{\text{Py}}$	$\delta^{34}\text{S}_{\text{H}_2\text{S}}$	$\delta^{34}\text{S}_{\text{Ccp}}$	$\delta^{34}\text{S}_{\text{H}_2\text{S}}$	$\delta^{34}\text{S}_{\text{Eng}}$	$\delta^{34}\text{S}_{\text{H}_2\text{S}}$	$\Delta^{34}\text{S}_{\text{alu-py}}$ (°C)	
1604-429	Alu I breccia with Py and Eng	18.3	-5.7*	-7.2			-5	-5.4	246	
0804-563	Alu II- Py vein	11.5	-2	-0.5						
0804-408	Alu II- Py- Eng vein	13.2	-14.9*	-16.4					195	
			-13.4*	-14.9					212	
1604-375	Alu II- Py- Eng vein	15.7	-2.6	-4.1			-2.2	-2.6		

1604-171	Alu II- Py- Eng-Bn-Ccp vein	12.4	<b>-0.2,</b> <b>3</b> <b>5.4</b>	<b>-1.7</b> <b>1.5</b> <b>3.9</b>	<b>-11.6</b>	<b>-11.8</b>	-4.1	-4.5	
1604-149	Alu II- Py- Eng-Tnt-Dg-Ccp vein	13.2	<b>-9.5*</b> <b>-10.7*</b> <b>-27.1</b> <b>-32.2</b>	<b>-11</b> <b>-12.2</b> <b>-28.6</b> <b>-33.7</b>	<b>-8.2</b>	<b>-8.4</b>	-2.4	-2.8	266 247
1604-231	Alu II- Py- Eng-Tnt-Bn-Ccp vein	11	-0.7	-2.2					
4012-354	Alu II- Py-Ccp-Gn-Sph vein	15.8							
2412-511	Alu III in Qz-Py vein	6.6							
3212-206	Alu IV-Py	7.5	3	1.5					

Bold numbers are SIMS S isotope results. Pyrite-H<sub>2</sub>S calculation from the fractionation of Ohmoto and Rye (1979); Chalcopyrite-H<sub>2</sub>S calculation from the fractionation of Li and Liu (2006); Enargite-H<sub>2</sub>S are based on sphalerite-H<sub>2</sub>S fractionation of Ohmoto and Rye (1979). \*Pyrite  $\delta^{34}\text{S}$  data used for  $\Delta^{34}\text{S}_{\text{alu-py}}$  (°C) temperature calculation from the fractionation equation of Rye et al. (1992). Alu-alunite, Bn-bornite, Ccp-chalcopyrite, Dg-digenite, Eng-enargite, Gn-galena, Kln-kaolinite, Qz-quartz, Sph-sphalerite, Tnt-tennantite