

2008 Fall Meeting  
Search Results

Cite abstracts as **Author(s) (2008), Title, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract xxxxx-xx**

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**"james cook university"**

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HR: 1340h

AN: V33B-2211

TI: Growth Controls in Colloform Sulfide Textures

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AB: Colloform textures have been described from many of the world's sulfide ore deposits and involve formation of distinct microcrystalline layers. These textures provide information related to sequential stages of ore formation and yet their mechanism and controls of growth are still poorly understood. Samples of colloform sphalerite from the Galmoy Zn-Pb ore body, Ireland and colloform pyrite from Greens Creek, Alaska have been investigated using crystallographic, in-situ S isotope and trace element chemistry analysis. Electron backscatter diffraction (EBSD) results indicate the crystal preferred orientation (CPO) of discrete microcrystalline colloform layers abruptly switch between <100>, <110> and <111> orientations in all of the samples investigated. Examination of the same layers in the Galmoy colloform textures (sphalerite) using in-situ laser S isotope analysis reveals equally striking and abrupt changes in  $\delta^{34}\text{S}$  signature between end-member bacteriogenic (-25‰) and hydrothermal (+10‰) sources. However, there is no correlation between shifting CPO and S isotope signature at Galmoy. The Greens Creek colloform textures (pyrite) preserve a similar, if less dramatic, variation in  $\delta^{34}\text{S}$  signature (-40‰ to -30‰) but again there is no correlation

5/03/2009

Growth Controls in Colloform Sulfide ...

signature (-40‰ to -30‰) but again there is no correlation between changing  $\delta^{34}\text{S}$  signature and CPO in discrete layers. Trace element analysis of both suites of colloform samples reveals major changes in trace element sequestration. The variation in trace element abundance however appears to correlate with changes in  $\delta^{34}\text{S}$  signature rather than CPO. At Galmoy Cd and Cl rich layers appear to correspond with a hydrothermal sulfur signature while Sb sequestration at Greens Creek corresponds with a relatively heavy bacteriogenic  $\delta^{34}\text{S}$  (-30‰) signature. While factors such as bacteria induced mineralisation cannot be ruled out, the temperature of the ore forming environment suggests this process is likely to be restricted and therefore not the primary control on CPO changes. In the absence of evidence for alternative mechanisms it is suggested that the most likely factors influencing CPO changes within discrete layers in the colloform textures are temperature and degree of supersaturation.

DE: 1041 Stable isotope geochemistry (0454, 4870)

DE: 3620 Mineral and crystal chemistry (1042)

DE: 3625 Petrography, microstructures, and textures

DE: 3665 Mineral occurrences and deposits

SC: Volcanology, Geochemistry, Petrology [V]

MN: 2008 Fall Meeting

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