

Ore Mineral Textures of the Midas Low-Sulfidation Epithermal Deposit: Implications for Ore-Forming Processes

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Ore and gangue mineral textures of high-grade quartz vein material from the middle Miocene Midas Au-Ag deposit near Elko, Nevada, were studied to identify the processes that resulted in precious metal enrichment at this low-sulfidation epithermal deposit. Ore minerals in high-grade samples occur as dendritic aggregates within distinct gangue bands. The delicate ore mineral dendrites are hosted by mosaic quartz that appears to have formed through recrystallization of a microspherical silica precursor. Based on the comparison to modern geothermal systems, this microspherical silica precursor is interpreted to originally have been gel-like opal-AG. The occurrence of ore mineral dendrites and microspherical opal-AG suggests that mineral precipitation at Midas occurred at far-from-equilibrium conditions. The findings of this study are consistent with previous models linking high-grade precious metal enrichment in low-sulfidation epithermal deposits to episodic flash vaporization of the hydrothermal liquids within hundreds of meters from the paleosurface.