

LETTER

**Microporous gold: Comparison of textures from Nature and experiments**

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ABSTRACT

Recent experiments have shown that microporous gold can be obtained via the oxidative dealloying of Au(Ag)-tellurides such as calaverite (AuTe<sub>2</sub>), krennerite (Au<sub>3</sub>AgTe<sub>8</sub>), and sylvanite [(Au,Ag)<sub>2</sub>Te<sub>4</sub>] under mild hydrothermal conditions. The same Au textures have been found in natural gold-telluride ores from the Late Miocene epithermal Aginskoe Au-Ag-Te deposit in Kamchatka, Russia. This confirms that natural microporous gold can form via the replacement of telluride minerals. This replacement may take place under hydrothermal conditions, e.g., during the late stage of the ore-depositing event, explaining the wide distribution of “mustard gold” in some deposits. At Aginskoe, the oxidation of Au-tellurides appears to have resulted only in local redistribution of Au and Te, because the associated oxidation of chalcopyrite scavenged the excess Te, inhibiting the crystallization of secondary Te minerals more than a few micrometers in size. Such cryptic mobility may explain the lack of reported secondary Te minerals in many Te-bearing deposits.

**Keywords:** Microporous gold, gold tellurides, micro-textures, epithermal deposit