

## **Fluid Sources of Epithermal Gold Deposition in Northeastern Russia**

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A deep-seated andesite astenolite with a volume of 50-100 km<sup>3</sup> a primary concentration of  $H_2O$  to be 3.5% which comes to the upper horizons of ore-bearing structures of the Okhotsk-Chukotka volcanic belt (3-6 km from the surface) may provide the origin and development of hydrothermal structure, stretching for 1.5 km at a depth in the supracrustal prism of disintegration, crushing, and fracturing in hosting rocks. Loosing 1% of water when it comes to the surface, the astenolite forms a flow of fluids, coming from the root zone of tightening of hydrotherms to the near-surface zone of their discharge and release. In favorable geological-geochemical conditions potential resources of this flow are sufficient to form Au deposits with reserves to be 10-100 tons. Water-bearing fluids are suggested to result from thermodynamically equilibrium interaction "andesite-water" in the zone of accumulation of hydrothermal solutions from peripheral magmatic chambers. Thus, intermediary magmatic chambers which are derivatives of the primary andesitic magma, are assumed. As a result of the interaction, Au and Ag which are found in andesites and rhyolites as Clark concentrations, are mobilized into a fluid phase with the enrichment factor by Au to be 200-500 times and Ag to be 100-200 times. In addition, meteoric waters, infiltrating to the root zone of the hydrothermal block through andesites and coming to the surface through fissure channels, cannot be a potential source of Au epithermal deposits. However, "empty" Au hydrotherms of the meteoric origin can participate in redistribution and remobilization of gold, early deposited, with its removal to the surface at the final stage of hydrothermal system existence. The deposition of solid solution Au-Ag in the flowing channels derives from the combined interaction of three main factors namely: decrease of pressure and temperature and the interaction of the fluid flow with hosting rocks. Au is separated from the hydrothermal solution into a solid phase by the fractionation of sulfide sulfur of hydrosulfide complex.