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# Crystalline Placer Gold from the Rio Neuquén, Argentina: Implications for the Gold Budget in Placer Gold Formation

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## Abstract

Recent fluvial sediments of the Rio Neuquén, Argentina, contain variable amounts of placer gold. In addition to rounded, detrital placer gold, the sediments also contain pristine crystalline gold (type 1 gold), which occurs as overgrowths on detrital placer gold cores. Type 1 gold is locally rimmed by gold with a wormlike or crystalline texture (type 2 gold). The chemistry of the primary cores indicates variable intragrain and intergrain compositional heterogeneity. This is interpreted to indicate a multisource origin. Type 1 gold is composed of virtually pure gold (>98 at. % Au) and type 2 gold is an Au-Hg amalgam (4–9 at. % Hg). Both varieties are authigenic in origin.

The formation of the virtually pure type 1 gold is interpreted to be due to the addition of Au from an external source, rather than by the removal of Ag and other metals. The AuHgAg type 2 gold is interpreted to be due to Hg contamination from historic mining. Type 1 gold is interpreted to be analogous to the Ag-poor rims present on many placer gold grains. The evidence presented in this study supports the view that the Ag-poor rims on placer gold grains are the result of Au addition and not Ag removal. This study also has implications for both quantitative morphological and paragenetic studies of placer gold grains.

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