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Preliminary Findings on Epithermal Au Mineralization of Bayındır, Kaman, Kırşehir, Turkey

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The Bayındır epithermal Au deposit, Kaman, Kırşehir, Turkey, has historic and active fluorite mining records. The present work aims at understanding of petrographic and alteration characteristics of host rocks and quartz veins, and determining the microthemometric properties of gold mineralization.

Kırşehir metamorphic rocks, consisting of schist, gneiss, quartzite, marble, and migmatites, form the basement in the area. The metamorphic rocks are intruded by Late Cretaceous-Paleocene plutonic rocks composed of syenite, alkali feldspar granite, monzonite, and diorite. The metamorphic and intrusive rocks are unconformably overlain by Tertiary continental to shallow marine sedimentary sequences. The fluorite mine and Au mineralization is hosted by quartz-clay–altered and moderately silicified syenite pophyry. The purple, light purple to green fluorite is hosted by subparallel quartz-barite veins within clay-serite–altered syenite porphyry. The alteration and fluorite mineralization appears to be associated with emplacement of aplitic syenite into the syenite porphyry. The gold mineralization occurs as NW-SE– and NE-SW–trending quartz and quartz-fluorite veins cutting the altered syenite porphyry and as disseminated to stockwork-type veinlets, plus as cementing the fault breccia. The quartz veins display banded, comb quartz textures common in low-sulfidation epithermal gold deposits. The veins are 5 to 35 cm thick and contain 3 ppm average Au. The gold mineralization is locally accompanied by pyrite, pyrrhotite, chalcopyrite, sphalerite, galena, arsenopyrite, and iron oxihydroxides.

Microthermometric analyses were carried out on quartz crystals. The fluid inclusion pegtrography enabled the recognition of three types of inclusions: (1) three-phase inclusions (FIA1), (2) inclusions with CO_2 (FIA2), and (3) two-phase (liquid-gas) inclusions (FIA3). The homogenization temperatures are as follows: FIA1—260°C, FIA1b—310°C, FIA2a—380°C, FIA2b—337°C, FIA3a—270° C, FIA3b—224°C, and FIA3c—190°C. The salinity values range between 6 and 20 % NaCl equiv. The CO_2 gas phase and relatively high homogenization temperatures and salinity suggest that there may have been a magmatic fluid contribution.