The Muteh mining district, the major gold plant in Iran, is located in the central part of Sanandaj-Sirjan metamorphic belt. It consists of two main ore deposits, including the Chah Khatoun and Senjedeh open pits, and several smaller occurrences (Fig. 1). Gold mineralization is hosted in green schist facies metamorphic rocks, and consists mainly of auriferous quartz veins. Pyrite is the predominant sulfide mineral, with minor amounts sulfide...
such as chalcopyrite, sphalerite and galena. Pyrite from the Senjedeh gold deposit was investigated using a combination of ore microscopy, including back-scattered imaging, and electron probe microanalysis (EPMA). A range of elements including Au, Se, As, Te, Ag, Pb, Bi, Cu, Co, Ni, Zn, Mo and Fe was analyzed with the aim to constrain the textural controls and influence of deformation on the distribution of gold in pyrite. Based on microscopic and field observations, there are two generations of pyrite, termed as first generation (G1), and second generation (G2). They have distinct contents, occurrences, and distribution patterns of gold. The coarse grained, unhedral and deformed G1 pyrite that is characterized by abundance of microfractures and porosities, contains high level of gold, whereas both invisible and visible gold are present in the G1 pyrite, medium grained, unhedral G2 pyrite, contains low- medium level of gold. Visible gold is widespread and present as irregular grains of native gold mostly along grain boundaries or filling microfractures of pyrite G1 (fig. 2) and just along grain boundaries of pyrite G2, likely resulting from remobilization of invisible gold once locked in the pyrite. Syn-deformational grain-scale mobilization of gold and other elements took place leading to a portion of the gold being recrystallized within fractures and microshears.

Gold distribution patterns in the pyrite, suggest a process of initial scavenging of Au into pyrite and subsequent remobilization of that Au following brittle fracture. Gold expelled from the sulfide lattice during the deforma tional event is reenriched around the margins of the pyrite grains and within swarms of cros scutting microfractures. The deformational event leads to gold enrichment in pyrite, where brittle fracturing brecciation and grain boundaries have been followed by a resorption and recrystallization.

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References
