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TRACE ELEMENT LOSS IN PYRITE AT DIFFERENT PRESSURE AND TEMPERATURE

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Pyrite is a common accessory mineral in orogenic gold deposit as in several deposit. Orogenic gold deposit systems are one of the most important sources of gold that is valuable for economic geology all around the world. Although ore fluid sources are debated by researchers, metamorphic fluid source is the most popular model recently. During syngenetic and/or early diagenetic formation, pyrite is enriched with gold and trace elements that are present in the water column. When the metamorphism starts, later pyrite overgrowths replace earlier pyrite, and some trace element and gold are released to fluids that may precipitate as a free gold in cracks or as a rim around the pyrite. If the metamorphism reaches high grade (Greenschist and/or Amphibolite facies), pyrite converts into pyrrhotite, and gold and associated trace elements are released to metamorphic fluids to form ore deposit. But this model is only based on the interpretation of pyrite and pyrrhotite with the optical petrography. Our research aim is to convert pyrite to pyrrhotite experimentally, and determine which trace elements are released or retained and in what quantities. To do this a piston cylinder apparatus was used to apply pressure and variety temperatures. After the conversion, reductant pyrrhotite was analyzed by scanning electron microscopy (SEM) to check amount of pyrrhotite produced, and laser ablation inductively coupled plasma mass spectrometry (LA-ICP MS) to determine which trace element. In this way, how trace elements are depleted and/or enriched at the reaction edge and if the pyrite converts partially into pyrrhotite, how these trace elements behave will be explained.