



The mineralogical phase transformation of invisible gold-concentrate by microwave heating, and enhancement of their gold leaching rate

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In this study, in order to obtain the maximum Au leaching rate, an invisible gold concentrate sample was microwave-treated and a thiourea leaching experiment was performed. It is found that gold exists as invisible as a result of observation with an optical microscope and an electron microscope. As the invisible gold concentrate sample was exposed to microwave longer, its temperature and weight loss were increased together and its S content was decreased. The conditions for the maximum Au leaching rate and the fast leaching effect were a particle size of -325×400 mesh, exposure to microwave for 70 minutes, 1.0 g of thiourea, 0.0504 g of sodium sulfite and 0.425 g of ferric sulfate. However, the condition under which Au was leached out to the maximum was applied to the control sample, but its Au leaching rate was just in a range of 78% to 88%. Such results suggest that the effect of sodium sulfite and ferric sulfate was more effective in the microwave-treated sample than in the control sample. Therefore, it was confirmed that the complete and very fast Au leaching can be achieved by means of the microwave pretreatment of invisible gold concentrate.