As contamination around Torghabeh gold mine deposit, Mashhad

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This deposits are located at the ~ 8 km west of Mashhad and ~ 3 km north of Torghabe. Torghabeh deposit is mesozonal orogenic type gold deposit. mineralized area in this deposit is part of collision zone formed during Late Paleozoic-Early Triassic time due to collision of Iran and Turan Plates. Orogenic gold deposits are typically strongly enriched in arsenopyrite and arsenian pyrite. (Goldfarb, 2005)

Historic mine and mining process in the mesothermal gold deposits of the Torghabeh gold field, generate extremely high As concentrations (up to 39 ppm).

With notice to US EPA (2004) As concentration can be variable between 0.39- 1.6 mg/kg in sediment and 0.01- 0.1 mg/l in water. Therefore this area with 39 mg/kg As in sediment is high pollution place but water in this location is not polluted (concentration of As in water is 0.09 in Max level this is les than WHO (2007) limit) high As concentration in soil and sediment is determine but PH in this location is about 6-9 in 6 samples were collected from streams. Therefore AMD is not be made and probably As is adsorbed with natural collector in sediment.

FTIR estimation of geometrical structure variations in natural SiO_2 crystal

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Infrared spectroscopy has been used to study the structure of quartz crystals and estimate the geometrical structural changes of the crystal structure. Investigation is based on the assignment of infrared bands to certain structural groups of SiO_4 tetrahedra. The variation of geometrical structure of quartz crystals has been ascertained by comparing the XRF results. The crystal structure analysis discussed here was necessary to investigate the correlation between the characteristic infrared band shift and crystal face size in the crystal growth. In the present work we address the IR and XRF technique for estimation of geometrical structure studies of some quartz crystals of Ouguri hills of Assam, India. To calculate the geometrical structures of the quartz crystals, the method applied here is the crystal faces calculations. The geometrical size of the quartz crystal is an indicator of the purity of the samples. We observed that the purity of the samples increases with increasing of the size of crystal faces and vise-visa. Another important factor is observed in the chemical composition of the samples is that; the trace elements of the samples are decreases as the size of the crystal faces increases. The infrared investigation is found to be good for structure elucidation and changes of geometrical shape of quartz crystals. The band of tetrahedral site symmetry at around 780 cm^{-1} in the 10μm region is little affected by pressure and temperature as compared to the absorption band at 695 cm^{-1} of octahedral site symmetry in the 20μm region. Therefore the shift of these two bands with the size of crystal faces of the quartz crystal throws light on the crystal growth and pressure-temperature (phase transition) during the process of formation