INVESTIGATION ON ARSENIC CONCENTRATION IN WATER AND SEDIMENT SAMPLES AROUND THE ABANDONED TORGHABEH GOLD DEPOSIT, NE IRAN

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Abandoned Torghabeh gold mine is located about 10 km at west of Mashhad, Khorasan Razavi province, NE Iran. The main ore mineralization is arsenopyrite ± pyrite ± gold ± quartz. Torghabe district is one of the most beautiful places in the province with many fruit orchards, so investigation on arsenic concentration in water and sediment at this restrict seems to be essential. Arsenic concentration in 6 water and 12 sediment samples of drainage basin were analyzed by atomic absorption. The concentration of arsenic was determined between 0.1-8.2 µg/l. It is lower than WHO (2008) standard limit .Arsenic concentration in sediment samples range from 2.87-23.15 mg/kg. Based on US EPA (2004) the standard limit of arsenic in sediments and soil at residential and industrial area are 0.39 mg/kg and 1.69 mg/kg, respectively. So all of the sediments in this district seems to be contaminated. XRD results show that the most frequent minerals in the sediments are quartz, calcite, albite, clinochlore ferroan and muscovite. In sediment with the higher content of As(>20 mg/kg) calcite was appear in the XRD results, but albite and muscovite are more frequent in the sediment with lower As content(<5 mg/kg). It should be concluded that calcite is one of the adsorbent minerals for arsenic at the sediments. It needs more detail mineralogical investigation.

Keywords: arsenic, Torghabe, Iran