Chapter 12
Tajikistan

Uranium occurrences are known in the Kuramin Range, southwestern Tien Shan mountains, in NW Tajikistan (Figs. 7.1, 7.2). First reports on the presence of uranium in this area date back to the 1920s and include the *Taboshar* and *Andrasman* deposits; both were mined. Other occurrences are known in the southern Tien Shan.

A uranium mill, known as *Leninabad mill*, was built at Chkalovsk, 15 km SE of Khudzhand (formerly Leninabad) in NW Tajikistan in 1945. It was originally operated by Combine # 6 and at last by Vostochny (eastern) Rare Metal Industrial Complex. Uranium ore processing started in 1946 and ceased in 1993. Since then, the mill has been modified to treat Pb-Zn-Ag ores. Mill feed derived at the beginning from ores of the Karamazar region and – between 1946 and 1950 – also by U concentrates from Bulgaria, ČSSR, East Germany, and Poland. The capacity was eventually expanded to 2 000 t U yr^{-1} when the mill began processing ISL slurries from the Kyzylkum region in Uzbekistan.

Sources of information. See at end of Chap. 12 *Tajikistan*.

12.1 Kuramin Range, SW Karamazar Region

The Kuramin Range is located in the southwestern part of the Karamazar uranium region that covers parts of Tajikistan, Uzbekistan, and Kyrgyzstan. Three U deposits are reported in the Tajikistan part of this range, from NE to SW: *Adrasman*, *Taboshar*, and *Keektal* (Fig. 7.2). Chapter *Uzbekistan* provides geological characteristics of the Karamazar region.

12.1.0.1 Taboshar

Taboshar is located near Sarimsakli, on the southern slope of the Kuramin Range, about 40 km N of Khudzhand. The deposit was discovered in 1927 and exploited in the 1930s for radium. Along with Tyuya-Muyun, Taboshar delivered the first production of radium in the Soviet Union. Radium was extracted at a special plant in the settlement of Taboshar established in 1934. Underground mining for uranium resumed in 1943 (6 mining levels) and Taboshar was the first deposit mined purely for uranium in the former USSR during World War II. The deposit yielded some 500 t U and is now depleted. Ore averaged 0.06% U and was processed at the Leninabad mill.

Geology and Mineralization

The Kuramin Range is part of the Chatkal-Kuramin uplift, a segment of the Ural-Mongolian orogenic belt of Hercynian age. Country rocks at Taboshar are granite and granodiorite of the second Hercynian phase, which were intruded into Proterozoic metamorphites. Deep rooted baryte veins up to 1 m wide and 2 km long cut the crystalline complex at intervals ranging from tens to hundreds of meters. Some of the baryte veins are mineralized by uranium and other metals. Wall rocks of such mineralized veins and fracture zones are altered by sericitization, silicification, and hydromicazation.

Primary mineralization of ore veins is rare and consists of a polymetallic paragenesis of pitchblende, bismutinite, chalcopyrite, galena, pyrite, sphalerite, tungsten minerals, and other sulfoarsenides associated with a quartz-pyrite-baryte matrix. Uranium occurs essentially as hexavalent U minerals such as sooty pitchblende, autunite, fritscheite, torbernite, uranotile, and zeunerite. Gangue minerals are mainly radiobaryte and/or quartz.

Secondary ore minerals constituted the bulk of mined ore. They occurred over a length of up to 1 km and a depth of about 250 m in several subparallel radiobaryte veins, some 10 cm to 1 m (av. 30–40 cm) wide, as well as in fracture zones in granite and granodiorite. A high-grade U zone existed at a depth of about 120 m.

12.1.0.2 Adrasman

This polymetallic deposit was discovered some 70 km NE of Khudzhand in 1934 but uranium was only identified in 1940. It was first mined for copper and bismuth in1945. Uranium mining by underground methods began in 1946 and lasted to the 1950s, yielding 103 t U. Ore grades averaged 0.053% U. Adrasman occurs in a geological setting similar to that at Taboshar and consists of vein-stockwork mineralization composed of a Bi-Cu-U association.

12.2 Other Uranium Occurrences in Tajikistan

A number of U occurrences are reported from the *Gissar* and *Karetegin Ranges* of the southern Tien Shan. They are associated with Paleozoic complexes and include: (1) pitchblende mineralization in Permian volcanics at *Khanaka, Paridan, Rafikon, Mumin*, and in granite at *Yakhob* and *Moscovskoye*; (2) pitchblende-brannerite-fluor apatite mineralization in granite at *Lugur* and *Farkak*; (3) pitchblende-fluor-apatite mineralization in Middle Paleozoic carbonatic rocks at *Vaidara*; and (4) bitumen-pitchblende as well as fluor apatite-bitumen pitchblende mineralization in metasediments at *Karategin* and *Kamaroy*.

Early known occurrences mentioned by Bain (1950) include *Ayni/Zakhamatabad* and *Dzhirgashal* where a 10–14 m thick horizon contains thin bands of roscoelite mineralization with intervals enriched in carnotite. This horizon could be traced for 25–30 km. Bain suggests a surficial origin of the ore.

References and Further Reading for Chapter 12 · Tajikistan

For details of publications see Bibliography.

Bain 1950; IAEA 1995; Laverov et al. 1992a–c; Kohl 1954; Mashkovtsev and Naumov 1999; OECD-NEA/IAEA 2001; Shcherbakov 1937; Boitsov AV and Kazansky pers. commun.