

## **Lithium-bearing pegmatites in the greenstone belt of the Archaean craton in Zimbabwe, Africa**

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Lithium-Cesium-Tantalum (LCT) type pegmatites are granitic rocks that form relatively small igneous bodies and are characterized by large crystals and a variety of distinctive textures. The LCT family of pegmatites takes its name from its characteristic enrichment in lithium (Li), cesium (Cs), and tantalum (Ta). Lithium in these pegmatites is extracted from lepidolite, spodumene and petalite. These LCT pegmatites account for about one-fourth of the world’s total lithium production, most of the tantalum production, and all of the cesium production. These are distributed worldwide including Australia, Afghanistan, Argentina, Brazil, China, Chile, Canada, Nigeria, and Zimbabwe.

Africa has extensive lithium resources mostly in the LCT-type pegmatites. The Li-bearing pegmatites are typically tens of meters thick and hundreds of meters long. Zimbabwe is having the largest hard rock lithium reserves in Africa. The main Li-producing mine in Zimbabwe is Bikita Mine. Other pegmatites with Li resources include Arcadia, Kamativi and Zulu regions. Most of the Li-bearing pegmatites are in the greenstone belt of the Archaean Craton and are similar to the Li pegmatites of Australia. However, the Li-bearing pegmatites of Kamativi are notably younger and more similar to the pegmatites of the Namaqualand in Namibia and South Africa.

The Bikita mine is located about 350 km south of Harare and is the most productive mine of lithium. The ore minerals in the Bikita mine include petalite, spodumene, lepidolite, tantalite and pollucite. Spodumene resource of 13 Mt with > 1.6% of Li<sub>2</sub>O has been identified. This resource of Archaean in age, is characterized by complex zonation and some classic pegmatitic texture.

The Li-bearing pegmatites of Archaean in age in Arcadia occur about 3 km south of Harare. These are stacked flat-lying pegmatites mainly containing petalite and spodumene. The Li reserve have been identified as 37.4 Mt with 1.22% Li<sub>2</sub>O. .

The Li-bearing pegmatites of Proterozoic in age in Kamativi are located about 700 km west of Harare. Spodumene is the main Li-bearing mineral in Kamativi with resources of 26.32 Mt @ 0.58% Li<sub>2</sub>O content. These types of pegmatites are common throughout the Dete-Kamativi area.

**Keywords:** LCT-type pegmatites; Lithium; Zimbabwe; Bikita, Arcadia; Kamativi