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MINERAL CHEMISTRY OF A NEW OCCURRENCE OF ALLANITE IN ELESWARAM FROM EASTERN GHATS GRANULITE BELT, INDIA

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Abstract

Electron Micro Probe (EMP) data of radioactive phases, viz., allanite, monazite and zircon from pegmatites associated with Khondalites from Eleswaram in the Eastern Ghats Granulite Belt (EGGB) is presented. Allanite with a size of up to 60 cm in diameter occurs in the pegmatites and is mostly in the metamict stage. On heating to 900°C, it gave clear reflections in its X-ray pattern, which compare well with allanite from the Grenville Province of south-eastern Ontario and south-western Quebec. In addition to allanite, monazite and zircon are the other radioactive minerals identified. These contain minor amounts of U and minor to major amounts of Th and Zr, besides a notable content of REE in all the three, with LREE being more than HREE in both the allanite and monazite. Furthermore, allanite is highly altered and exhibits different stages of metamictisation, characterized by loss of major elements and REE with enrichment of Th, rendering the altered allanites to be relatively more radioactive. An unknown Y-rich mineral (Ca-Y-Ti silicate) was found with an unusual composition in the REE, with HREE > LREE. It is suggested that a detailed investigation of EGGB may lead to locate more similar such findings, having high potentiality for REE.

Keywords: Electron Microprobe data, allanite, monazite, zircon, Eastern Ghats Granulite Belt, Andhra Pradesh, India