

ASBESTOS MINERALIZATION IN VEMPALLI FORMATION NEAR SOMASILA VILLAGE, KOLHAPUR MANDAL, NAGARKURNOOL DISTRICT, TELANGANA, INDIA

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Abstract

Asbestos mineralization is found localized in massive serpentinite and dolomite horizons at the contact layers in cross folded portions of the ultramafic bodies. Dolomite is observed as the host rock for asbestos mineralisation in the Vempalli Formation, Cuddapah Supergroup which covers the area of Somasila, Rampur, Pentlavelli, Balapamgattu Chinnampalli in Kolhapur mandal in Nagarkurnool district. The fibrous stratiform asbestos extends over 1.5 kilometers along the strike. Study reveals that the formation of asbestos has taken in the ultrabasic and metamorphic rock formations at Somasila and the surrounding areas. The asbestos samples in green dolomites were collected and analyzed by XRF for evaluating the major oxides and trace elements in the samples. Fibre development is suggested to be a dynamo-thermal process in structure-restricted zones of secondary serpentinisation in the serpentinised ultramafic body. Before being subjected to analysis they were checked for impurities like Calcite, & Quartz under the microscope. The major constituents of asbestos viz. SiO₂ (42.50%) and MgO (40.15%) and their ratios are almost equal in all the samples. CaO (0.53%) and FeO (0.70%) are very less. Na₂O (0.02%) & K₂O (0.001%) occur as traces. Analysis of trace elements in the asbestos samples shows significantly high Zn (76 ppm) values. The study reveals that the magnesium rich hydrated silicate is crocidolite. Only chrysotile occurs in the asbestiform habit. Of the amphiboles amosite and crocidolite occur only in the asbestiform habit, while tremolite, actinolite and anthophyllite occur in both asbestiform and non-asbestiform habits (USGS, 2001).

Keywords: Asbestos, Dolomite, Mineralization, Genesis, Nagar Kurnool.

1. Introduction

Asbestos is the common name applied to a group of natural, fibrous silicate minerals, which were once one of the most popular raw materials to be used in building materials. Asbestos was mainly used for the production of an assortment of asbestos-cement products. The term asbestos is a generic designation referring usually to six types of naturally occurring mineral fibers that have been commercially exploited. The identification of asbestos fibers can be performed through morphological examination, together with specific analytical methods to obtain the mineral composition and structure. Early uses of asbestos exploited the reinforcement and thermal properties of asbestos fibres. The first recorded application can be traced to Finland (approximately 2500 B.C.), where anthophyllite from a local deposit was used to reinforce clay utensils and pottery (Bradley and Van Goshen, 2007). Morphological characterization by itself does not constitute a reliable identification criterion (Fox, 1934; Coulson, 1934; Cooke, 1936; Dresser, 1917). Hence, microscopic examination methods and other

analytical approaches are usually combined. The usual definition of asbestos fiber excludes numerous other fibrous minerals that may possess an asbestiform habit but do not exhibit the properties of asbestos (Graham, 1917; Hall, 1930; Jhanwar, 1963; Jhanwar, 1964; Laubscher, 1968, 1969; Murthy, 1950). A few examples of these fibrous minerals are Sepiolite, Erionite (rod-like and fibrous habits), Chrysotile and Nepheline (Keith et al., 1969; Ramam et al., 1979). The present investigation was taken up primarily to study the asbestos and some other rock types like granites and limestone based on detailed geological mapping and petrography. The physical properties of asbestos, besides fibrous character, such as, fineness, flexibility, tensile strength & length of fibres, infusibility, low heat conductivity and high resistance to electricity & sound as also to corrosion by acids, make asbestos commercially important. Geochemical studies were carried on the samples collected from the study area hosting dolomitic country rock, serpentine and an ultra-basic rock. Commercial asbestos is classified into two main mineralogical groups: serpentine asbestos or chrysotile