QUANTITATIVE ANALYSIS OF CRYSTALLINE SILICA IN $CaCO_3$ SOURCES IN SRI LANKA EFFECT FOR LUNG DISEASES AND INDUSTRIAL USES

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Abstract

Silicosis and lung cancers are increasing in the society and it becomes a new threat as well. Medical reports reveal that majority of the affected people are labors who are working with the minerals base industries. The researchers have found that the main reason for silicosis and lung cancers of the labors was inhalation of crystalline silica dust during long period of times with high or low frequencies. For industrial base the crystalline silica content of the raw materials are also effect for the good quality final product and grind ability problems. Cement manufacturing is a perfect example.

Silicon dioxide is a naturally occurring mineral and it may exist in either crystal or amorphous forms. Crystalline silica exists in several forms: Quartz, Cristobalite, Tripoli, and Tridymite. Quartz is the most common form found in nature and in industrial use. All these forms may become respiratory size particles when workers chip, cut, drill, or grind objects that contain crystalline silica.

Main objective of this study is to investigate the amount of Crystalline silica by the locations in $CaCO_3$ sources in Sri Lanka. The results were obtained by using two methods. For sample collection over all 63 samples were collected in different locations in Sri Lanka respectively Calcite, Dolomite and Coral samples by 23 from each . Those were XRF analysis method (LS_F09_6 method) and determination of free silica in kiln feed method. As the results it shows that Dolomite contains high amount of Crystalline silica than other two mineral sample categories. In Aluwihara and Bokkawela dolomite had very high amount of Crystalline silica content as well. As a conclusion Out of above mentioned three types dolomite contains high amount of Crystalline silica percentage and In Aluwihara and Bokkawela dolomite that will cause many of lung diseases and industrial effects as a raw material.