GEOCHEMICAL APPRAISAL OF LIMESTONE RESOURCES OF EASTERN SALT RANGE FOR USE IN CEMENT INDUSTRY

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Abstract

The increasing demand of cement in the country due to population heave and present socio-economic scenario has necessitated the exploration and development of various limestone resources. Salt range has inexhaustible resources of limestone and a number of cement industries are working in this area. The present study is based on field investigations of limestone wealth of Eastern Salt Range which starts from Jogi Tilla in the east to Nilawahan Gorge in the west. Chip channel sampling is carried out in various locations and the stratigraphic sections are measured to find the thickness of these limestone units. Five rock samples collected from Ara-Basharat road are chemically analyzed for content of CaO, MgO, SiO_2, Fe_2O_3, Al_2O_3 and LOI (Loss on Ignition) in the chemical laboratory of Geological Survey of Pakistan, Lahore. In cement making, the limestone containing more than 45 % calcium oxide is generally preferred, the impurities of, SiO_2, Fe_2O_3, Al_2O_3 are ideal, whereas MgO constituent should be less than 2.7 percent. Lower Eocene limestone resources in Chor Gali Formation, Nammal Formation and Sakesar Limestone formation are present in Nilawahan gorge and along the Ara-Basharat road. The thicknesses of Chor Gali Formation and Sakesar Limestone at Nilawahan gorge are 16 meters and 40 meters respectively, whereas the thicknesses of Nammal Formation and Sakesar Limestone at Ara-Basharat road are 21 meters and 26 meters respectively. The mean percentage values of CaO, MgO, SiO_2, Fe_2O_3, Al_2O_3 and LOI (Loss on Ignition) are 51.80, 1.26, 2.92, 1.11, 0.73 and 41.59 respectively in the rock samples. The study concluded that the limestone resources of Eastern Salt Range are fairly thick and within the range of use in cement manufacturing. These reserves can be exploited for cement and suitable chemical applications.