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COMPOSITIONAL AND THERMAL CHARACTERIZATION OF DOLOMITES OF KALADGI BASIN, KARNATAKA, INDIA

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Abstract

The dolomites of the Kaladgi basin located near Neeralkeri (16°73'00":75°42'00") and Katageri (16°04'10":75°38'20") are medium to fine grained, compact and massive crystalline rocks. Fossils or biogenic fragments and opaque minerals are totally absent. These dolomites are composed mainly of mineral dolomite, with traces of calcite and quartz. Replacement of precursor minerals, especially calcite by dolomite is a common feature.

The MgO content of dolomites varies from 19.57 to 21.35% (av. 20.37%) while CaO varies from 30.24 to 38.39% (av. 35.08). SiO_2 (av. 0.53%), Al_2O_3 (av. 0.09%) and Fe_2O_3 (av. 0.71%) in these dolomites are low. The values of MgO (20.37%), CaO (35.08%) and insolubles like SiO_2, Al_2O_3 and Fe_2O_3 (1.34%) indicate that these dolomites can be classified as refractory grade.

DTA results have revealed two stages of endothermic reactions at temperature ranges of 760-765°C and 822-828°C, related to thermal decomposition of dolomite and calcite respectively. The first peak is associated with the formation of magnesia (MgO), calcite $CaCO_3$ and CO_2. The second peak represents the decomposition of calcite and formation of lime (CaO) coupled with release of CO_2. TGA curves suggest that between 695^0 and 775°C, the maximum weight loss of 45.0 to 48.0% has taken place due to the decomposition of dolomite and formation of calcite and release of CO_2.

Keywords: Kaladgi Basin, dolomite, mineralogy, chemistry, thermal studies.