CHARACTERISTICS OF SRI LANKA MARINE GYPSUM AND ITS DEHYDRATED MATERIALS

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Sri Lanka is devoid of rock gypsum ($Ca\ SO_4.2H_2O$) and the only available source of gypsum is the Marine Gypsum which is a by - product of the salt manufacturing industry. Annually a considerable amount of marine gypsum is produced and at present a part of this production is used in the cement industry as a gypsum retarder.

Samples of marine gypsum from Palavi salt deposits were examined using different experimental techniques. The tested samples were identified as gypsum in the form of monoclinic type crystals, by using x-ray diffraction techniques. Also two endothermic reactions at 130°C and 170°C in Differential Thermal Analysis reveals the presence of gypsum. Scanning Electron Microscope studies showed platy type crystals but comparatively larger than normal rock gypsum crystals. Chemical anlaysis indicated a fairly high content of impurities, specially the presence of about 6.0 per cent of silica as an impurity.

In the present study some experiments were carried out to convert marine gypsum into its hemihydrate form ($CaSO_4.\frac{1}{2}H_2O$), by heating in open atmosphere, at different temperatures. The physical properties of the hemihydrate formed were tested to study its potential as a hardening material. The material which was dehydrated at 170°C showed most desirable physical properties such as low water demand, surface hardness of 120 kg/cm^2 and bending strength of 3.2 kg/cm^2.

However, a long setting time around 60 - 80 min. was observed. The physical properties of low quality Plaster of Paris which is used as building material was tested and the results revealed that the quality of these samples were similar to that of products derived from marine gypsum. It is therefore concluded that hemihydrated marine gypsum could be used as a substitute for imported low quality Plaster of Paris for building material.