**STABILIZATION OF INDUSTRIAL BY PRODUCT USING ALKALI ACTIVATION**

**ABSTRACT**

With increase in the growth of industrialization, proper disposal of wastes is one of the major issues nowadays that has to be handled with seriously. An innovative solution that is efficient and environment friendly is required to tackle this problem of disposal. Research has sprung to full pace in recent years on how to utilize these waste materials in an effective way. Geopolymerization is the latest trend in that path. The basic requirements for the synthesis of any geopolymer are alkali solution and aluminosilicate material. So the by-products which are rich in Silica and Alumina can be used as aluminosilicate sources. In the present work, four by-products namely ground granulated blast furnace slag (GGBFS), fly ash, rice husk ash (RHA) and red mud were taken as raw materials. All the materials except rice husk ash constitute alumina along with silica. Rice husk ash, being rich in silica, was taken as one of the raw material to investigate the effects of NaOH on it. These four materials were activated by NaOH with varying percentages i.e. 5%, 10%, 15% of raw material. Light compaction tests were conducted for each addition of chemical to the raw material. The effect of different percentages of NaOH on the strength of raw materials was investigated by unconfined compressive tests. For each combination of raw material and percentage of NaOH, three samples were prepared at optimum moisture content (OMC) and maximum dry density (MDD) and kept for curing at ambient temperature for prefixed periods (i.e. 0day, 7days, and 28 days). Mineralogical analysis of the samples was done by X-ray diffraction (XRD) analysis. The results show that with increase in percentages of NaOH, the strength of GGBFS and fly ash increases. But the strength of alkali activated RHA on 7th day of curing decreases from the immediate strength due to presence of carbon in the material. The strength of red mud with 5% NaOH on 7th day is higher than the immediate strength and for other percentages, the strength decreases. The reaction between alkali and slag is quick which completes with 7 days of curing. Reaction products were found to be sodium aluminium silicate in GGBFS, fly ash, and RHA from XRD analysis