



Application of Response Surface Methodology: Optimum Mix Design of Fly ash geopolymer mortar, a Portland cement free binder for sustainable construction.

T. Revathi^{1*}, R. Jeyalakshmi², N. P Rajamane³, JBaskarasundararaj⁴

^{1,3,4}Centre for Concrete Research, SRMU, Kattankulathur, 603203, India

²Department of chemistry, SRMU, Kattankulathur, 603203, India

Abstract : Geopolymers are inorganic polymers fashioned from the alkaline activation of amorphous alumino-silicate substances ensuing in a 3-dimensional polymeric community. Geopolymerisation is an innovative technology that may remodel several aluminosilicate materials into beneficial products and programs are infinite: creation and infrastructure industry, ceramics and poisonous metals containment and plenty greater. However due to the variability in the raw substances chemical composition, reactivity, activator kind and concentrations, reaction (curing) time and temperature, the product properties various widely. Hence optimization of system parameters necessitated for the excellent control of products in big scale up production. To clear up the optimization trouble of parameters and situations in fly ash geopolymer instruction correctly, a sequence of studies, experiments were designed and carried out the usage of response surface method (RSM). Firstly, Single component gradient analysis changed into adopted to decide the reasonable degree of various factors inside the reaction surface evaluation and 28-day compressive electricity development has been fixed as target performance parameter which rely upon response manage parameter together with sodium silicate modulus, NaOH content, water /fly ash ratio, silica content, curing temperature and curing time. Secondly, the practice situations were optimized to enhance the 28-day compressive power of the substances based at the imperative composite layout and high strength geopolymer materials became prepared through this technique. The study also proved the effectiveness of RSM to optimize the training situations of geopolymer

Keywords: Geopolymer, Fly ash, compressive strength, Response surface methodology(RSM).