Title:Geopolymer Concrete Formulation Using Coal Fly Ash as a Primary Binder

Abstract: coal fly ash, a major by-product of thermal power plants, poses significant disposal challenges. This research focuses on valorizing fly ash by using it as the primary aluminosilicate source for creating high-strength, low-carbon geopolymer concrete. The project will investigate the optimal chemical activation process, study the effects of different alkaline activators on curing time and compressive strength, and evaluate the long-term durability of the resulting concrete. The objective is to develop a commercially viable, environmentally friendly alternative to traditional Portland cement for construction applications.