

Geopolymer from Industrial Wastes and its Applications

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Geopolymer is known as environmentally friendly and sustainable material. It can be synthesized with low energy consumption process at room temperature or slightly above. Geopolymers can be prepared from any materials composed of silica (SiO_2) and alumina (Al_2O_3). Wide range of materials is presently used for geopolymerization. Besides the natural aluminosilicate materials such as clay like metakaolin and bentonite, the industrial by product and industrial wastes which included the materials rich in silica and alumina for examples; fly ash, blast furnace slag, aluminium waste, and rice husk ash. In our study, series of geopolymer have been synthesized; using local kaolins in Thailand, porous geopolymers, microwave assisted geopolymer, geopolymer for heavy metals adsorption and immobilization. Geopolymer can be prepared in bulk or porous form depends on the desire properties and applications. Proportion of H_2O and Na_2O , curing temperatures and time were varied to study their effects. The existing phases were investigated by using XRD. Compressive strength and density of the geopolymers were also examined. Geopolymerization was determined by FTIR. The main properties for example phases, mechanical strength, bonding, microstructure and thermal properties were characterized and compared.