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# Fabrication of Highly Porous Na-Geopolymer via Metal Powder Doping

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*Abstract*— Geopolymers are a class of materials belongs to a broad category of inorganic polymer having a connection of mechanical strength and stability by basic and porous ceramics, which are associated at higher temperatures. The most essential advantage of geopolymers is can be constructed at ambient temperatures. In this study, the main parameters such as different curing temperature, and Weight percentages of reactive metal powder such as silicon (Si) are used as pore forming agent were studied. the temperature 30$^{o}$C, 50$^{o}$C and 70$^{o}$C were applied to investigate the optimized temperature simultaneously the various weight percentages of pore forming agent were used to investigate the optimized condition to get desired porosity of geopolymers. The reactivity of Silcon depend hydroxide compound formation at the surface to be consumed in the geopolymerization process. The reaction become continues by reacting metal ions with alkaline medium to yield $H_2$ gas and a hydroxide compound ($M_x(OH)_y$) to form oxide and water to form porous geopolymers. Results of this study revealed that optimized curing temperature was 50$^{o}$C and 1 weight percentage of silicon metal powder to obtained porosity of (75%) to use them for micro/Nano membrane processing for water and wastewater treatment.

*Keywords*—Fabrication, Geopolymerization, Metal Powder, Micro/Nano membrane, Wastewater Treatment,