

## Effect of Microwave Energy on Rapid Compressive Strength Development in Coal Bottom Ash Geopolymers

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A microwave energy has been shown to be an innovative curing tool for geopolymers due to its fast, volumetric heating characteristics. However, the effect of microwave on geopolymers and the mechanism of development of compressive strength have not been fully understood. Here, we synthesize coal bottom ash geopolymers by applying additional microwave energies to the specimens pre-cured in a 75°C dry oven for a day. The compressive strength of geopolymers was measured corresponding to the microwave powers and irradiation times. The compressive strength showed higher than 65 MPa within a certain percentage of weight loss compared to the initial value regardless of microwave operation conditions. It was found an adequate amount of microwave irradiation has accelerated the geopolymerisation reaction and restored the cracks that occurred at the initial microwave heating. On the contrary, the prolonged time of irradiation has weakened the geopolymer structure as it was ruptured by overheating. The results show how the microwave energy lends itself to the strength development of bottom ash geopolymers, which would ultimately lead to the more utilization of microwave in the field.