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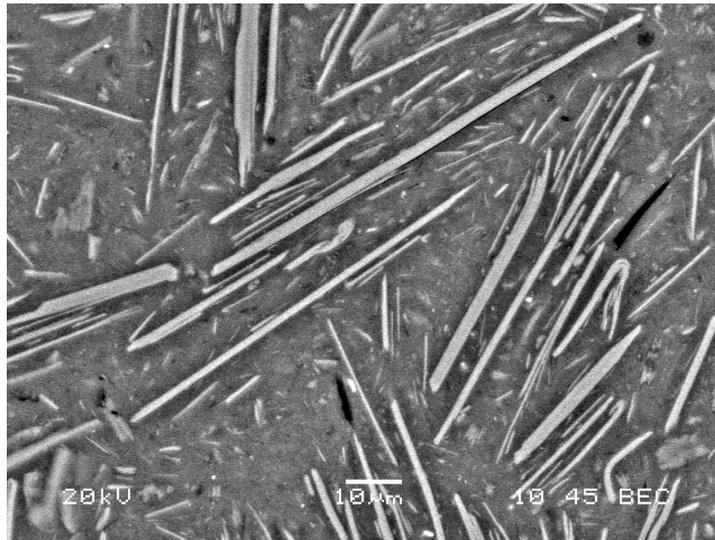
MICA PLATELET-REINFORCED, GEOPOLYMER COMPOSITES

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The mica flakes were obtained from the Cogebe Company as phlogopite mica paper type Cobebi P160 containing no organic or inorganic binder. Mica can withstand temperatures in excess of 1000°C. Phlogopite, of composition $(\text{KMg}_3(\text{AlSi}_3\text{O}_{10})(\text{OH})_2)$ is flame-retardant, non-flammable, does not give off fumes. It conducts very little heat, especially perpendicular to its strata. Natural mica has a dielectric strength greater than 25 kV/mm (625 V/mil), has good resistance to arcing and electrical erosion, and is permeable to microwaves. Mica has good compressive strength. It behaves well in the presence of tensile and bending stresses. It has a high modulus of elasticity. Geopolymer composites based on Na or K where fabricated having a matrix composition $\text{M}_2\text{O}\cdot\text{Al}_2\text{O}_3\cdot 4\text{SiO}_2$ where M = Na or K. Increasing amounts of mica were dispersed in the geopolymer matrix under vibration, and the composites were set under ambient conditions. The mechanical properties were measured in 4-point flexure as a function of in situ and post mortem temperature to 1,000 °C and their Weibull moduli were analyzed from the statistical data. The microstructure was examined by SEM/EDS.



SEM micrograph of phlogopite mica platelets dispersed in $\text{K}_2\text{O}\cdot\text{Al}_2\text{O}_3\cdot 4\text{SiO}_2\cdot 11\text{H}_2\text{O}$ geopolymer which was set under ambient conditions