Enhancement thermal, curing, mechanical properties of nano-sized silica and Si-MCM41 filled epoxy composites for electronic packaging application

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Epoxy composites used to containing particulate fillers-fused silica, glass powder, and mineral silica were investigated to be used as substrate materials in electronic packaging application. Nano sized Si-MCM41 is mesoporous silica materials.Using this material by underfiller. The content of fillers were 50 vol%. The effects of the fillers on the thermal properties—thermal stability, thermal expansion and dynamic mechanical properties of the epoxy composites were studied, and it was found that fused silica, glass powder, and mineral silica increase the thermal stability and dynamic thermal mechanical properties and reduce the coefficient of thermal expansion (CTE). The lowest CTE value was observed at a fused silica content of 40 vol% for the epoxy composites, which was traced to the effect of its nature of low intrinsic CTE value of the fillers. And using Si-MCM41 as filler substrated hardener. Analyzed curing properties using DSC. Mechanical properties measured by UTM.