Material Science

SYNTHESIS OF POLYBENZOXAZOLE FOAM

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The lack of qualified packing systems above +250ºC is a major obstacle in fully realizing the potential of advanced high performance semiconductor materials in military and commercial systems. It is therefore necessary to produce a packaging material able to withstand higher operating temperatures and increased thermomechanical capability with the semiconductor substrate. To this end, a novel polybenzoxazole (PBO) foam material was produced via a two step process involving a polyhydroxyimide (PHI) intermediate microsphere. When heated to >300°C, the PHI microsphere cyclizes to PBO and absorbs large amounts of heat during the cyclization reaction. Examination of the resulting foam demonstrates lightweight, non-flammable, non-toxic, shock resistant foam with thermal stability from -260ºC to +600ºC.