

Shape Memory Aerogels For Space Applications

Silica-based aerogels are excellent thermal insulators, but do not have mechanical integrity. Efforts to crosslink networks of aerogels by epoxies and polyurethanes have resulted in some success at NASA and other research laboratories, but the compressive strengths of these materials are still poor. We have developed methods by which networks of aerogels can be crosslinked with shape memory polyurethanes to offer desired compressive strength. The research program has led to development for the first time, a low density shape memory aerogel composite material for potential applications in space suit and space shuttles.