Market Need
Aerogels are used for a wide variety of applications, yet they are still limited by certain aspects of their production. The two main limiting factors are solvent exchange and drying. Ambient pressure drying is cheap and rapid, but it cannot produce aerogel monoliths. Supercritical drying yields monoliths, but the procedure is time-consuming and considerable capital expenditures are necessary to purchase the drying equipment. Drying issues also limit the ability to fabricate custom shapes, which in turn limits usability.

Technology Summary
This novel invention is a process that leads to the fabrication of custom shaped aerogels. This process employs freeze drying, which reduces capital expenditures by about 50% when compared to supercritical drying and also significantly reduces hazards. Production is rapid due to a process that requires no or one solvent exchange. This process also allows fabrication of custom-shaped parts via molding. Samples are typically opaque but can also be made translucent by suitable modification of the processing parameters. These custom-made aerogels can be applied to various areas of interest such as industrial, architectural and engineering applications. They allow for both thermal and acoustic insulation as well as ballistic protection and shock absorption.

Technology Status
Bench-scale manufacturing has been successfully carried out with this method. Patent pending: U.S. and foreign rights available. This technology is available for licensing to industry for further development and commercialization.