Fabrication and Characterization of Aluminum Oxide Aerogel Backlighter Targets*

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Aluminum oxide aerogel is of interest as a backlighter target to provide a radiation source for diagnostics during ICF experiments. Initial freestanding targets of 98 mg/cc have been fabricated and shot at the Rutherford Appleton Laboratory. This initial result showed a narrowing of the emission peaks versus fell density foil. The fabrication of these targets begins with a solution of aluminum chloride, ethanol, and water. It is then catalyzed with propylene oxide to gel within molds to form the shape. Supercritical drying with carbon dioxide provides the dry aerogel. By adjusting the relative amounts of starting materials and post treatment condition, various target densities can be made. The finished materials were characterized via x-ray fluorescence, nitrogen adsorption, and thermogravi-metric analysis.

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