

## **Aerogel Fabrication Via Modified Rapid Supercritical Extraction (RSCE) Process - Needle Valve Pressure Release**

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**Abstract :** Silica aerogels were fabricated through a modified rapid supercritical extraction (RSCE) process. The silica aerogels were made using a tetramethyl orthosilicate precursor and then placed in a hot press and brought to the supercritical point of the solvent, ethanol. In order to control the pressure release without a pressure controller, a needle valve was used. The resulting aerogels were then characterized for their physical and chemical properties and compared to silica aerogels created using similar methods. The aerogels fabricated using this modified RSCE method were found to have similar properties to those in other papers using the unmodified RSCE method. Silica aerogel infused glass blanket composite, graphene reinforced silica aerogel composite were also successfully fabricated by this new method. The modified RSCE process and system is a prototype for better gas outflow control with a lower cost of equipment setup. Potentially, this process could be evolved to a continuous low-cost high-volume production process to meet automotive requirements.

**Keywords :** aerogel, automotive, rapid supercritical extraction process, low cost production

**Conference Title :** ICAAIM 2021 : International Conference on Aerogels and Aerogel-Inspired Materials

**Conference Location :** San Francisco, United States

**Conference Dates :** November 01-02, 2021