



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Justin To</b>	<b>Project Number</b> <b>S0518</b>
<b>Project Title</b> <b>Much Ado about Nothing: An Analysis of the Creation of Subcritical Silica Aerogel and Its Properties</b>	
<b>Objectives/Goals</b> Objectives: To create silica aerogel under subcritical conditions.	
<b>Methods/Materials</b> Method/Materials: In the first stage of a three-part process, tetraethyl orthosilicate is combined with methanol, water, and an acid; afterwards, it is sealed and put into a drying oven. In the second stage, an additional mixture of isopropyl alcohol and a base is added, and the mixtures remain in the oven. In the final stage, the mixture is unsealed and is allowed to dry. By experimenting with the time each stage spends in the oven, I can optimize the final result. A basic water displacement experiment was done to determine each sample's density, and I used a dual-pressure sensor to determine how much force it took to crush each sample.	
<b>Results</b> Results: The various samples that I created were not very similar to aerogel in terms of properties, and so I doubt they can be classified as aerogels. Although some of the samples looked identical to aerogel, they lacked aerogel's characteristic low density, optical traits, and mechanical strength.	
<b>Conclusions/Discussion</b> Conclusion: As I am inconclusive as to whether I have created aerogel or not, I can not properly compare the properties of that of my samples to those of normal aerogel. I am still conducting research into refining my methods and possible new methods in creating subcritical aerogel at this time.	
<b>Summary Statement</b> Creating aerogel under subcritical and economical conditions	
<b>Help Received</b>	