



Colorado Science and Engineering Fair

2024 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Polymerization Using Alginate Spherification

Finalist's Name: Tess Price

School and City: Ken Caryl Middle School, Littleton

Sponsor's Name: Robert Price

Category: Chemistry (CHEM)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

My project is called Polymerization Using Alginate Spherification. Have you ever heard of boba? They're little popping balls that you would typically find in some sort of tea. Boba is a great example of something created by the process called polymerization. While I am using Boba for this experiment, this concept can be used for much more important and life changing solutions. My project is about testing different chemicals to see which ones can polymerize. My main question is: Which chlorides will complete the polymerization process, and will I be able to predict this based on their atomic properties? I predict that chemical compounds in the same molecular family as calcium chloride will also react with sodium alginate to complete polymerization, chlorides made with alkaline-earth metals that have a higher atomic number will be more effective at polymerization, chlorides where calcium is replaced by an element with a single valence electron, alkali metals, should not spherify at all. If bullet point two is confirmed, chlorides made with alkaline-earth metals that have a higher atomic number will also be able to polymerize at more acidic pH levels. From this we can see that my hypothesis was correct! From my results you can see that barium chloride could fully polymerize at a more acidic level than calcium chloride could. This means I am able to predict the outcomes based on the chemical's atomic structures, and I can change and manipulate the strength of the end result.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with your Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.