



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

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| Name(s) Anysia M. Callejo | Project Number J0603 |
| Project Title The Surface Tension of Different Liquid Types | |
| Objectives/Goals Surface tension strength really depends on many factors, not just electrical attractivity, adhesion, and cohesion. The chemicals and other molecules that may be within the liquid greatly affect the surface tension. The electrical attractivity can affect the strength between each of the molecules within a liquid, adhesion causes for these molecules to be more attracted to other surrounding molecules, and the cohesive forces cause for the molecules to be attracted and bond with the molecules within the liquid. I will be testing how surface tension differs within the type of liquids. These liquids are to be categorized as ionic, polar, or nonpolar liquids. Each of these liquids has intermolecular forces that allow for surface tension to occur. The ionic, polar, or nonpolar bonds affect the strength of the intermolecular forces in the liquids and the electrical attraction between each of the atoms within the molecules. The surface tension of these different types will be tested to see which type of liquid is the strongest. | |
| Abstract | |
| Methods/Materials For my single-beam balance, I used a wooden board, thread, felt pads, 2 pieces of wood, 1 nut, a paperclip, tin can, 2 hooks, hot glue, and nails. Other materials were play-doh, AWS-100 Digital Scale, latex gloves, rice, 2 small containers, distilled water, vegetable oil, and bleach. | |
| Results My experiment resulted with bleach being the weakest, oil being the second strongest, and water being the strongest. The first round resulted with 1.94 grams for water, 1.43 grams for bleach, and 1.71 grams for oil. The second round ended with 2.25 grams for water, 0.91 grams for bleach, and 1.46 grams for oil. The third round ended with 2.38 grams for water, 1.06 grams for bleach, and 1.12 grams for oil. | |
| Conclusions/Discussion My project had unexpected results. The bleach was the ionic liquid but somehow ended up being the weakest. This is when I realized that it the type of bleach I used had affected my results. I had used "Splashless Bleach" and the other chemicals in it had changed the outcome. However, this just goes to show how other chemicals change the surface tension and behavior of the previous liquid. My project can help others understand the science behind liquids and why they behave in the way they do. It shows how the structure, electrical attractivity, and other intermolecular forces affect the behavior of liquids. | |
| Summary Statement My project shows how surface tension changes with the different types of liquids, and the specific characteristics that account for their behaviors and the surface tensions. | |
| Help Received David Olvera had helped me with understanding surface tension. We had done labs to test measure the electrical conductivity of ionic liquids and molecular compounds. This made me take into consideration how electrical conductivity and attraction came into play. | |