



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Alyssa P. Cerda	Project Number J2004
Project Title Analyzing the Effects of Sulfates on Hair Tensile Strength	
Abstract Objectives/Goals The objective of this study is to determine if sulfate free shampoos versus sulfate containing shampoos affect hair tensile strength in different ways. Methods/Materials I will be using human hair strengths, four different shampoos (2 containing sulfates, 2 containing no sulfates), plastic bags, rice to pour into bags taped to end of individual shampoo treated hair strands, duct tape, ring stand, digital scale (measured in grams). I will test each type of treated hair strand by taping a plastic bag to the end of the strand, then taping the other end of the strand to the ring stand. I will slowly pour grains of uncooked rice into the plastic bag until the hair strand breaks. Then I will measure how much rice the hair held in the bag on the digital scale. Results The sulfate-free shampoo had the worst effect on hair. When compared to the control group (no shampoo at all), the best Sulfate shampoo average had a difference of 5.12 grams. The best sulfate-free shampoo average had a difference of 10.82 from the control group. The sulfate-free shampoos held an average of 75.5 grams. The sulfate shampoos held an average of 60.7 grams. The hair treated with only water (control group) held an average of 60.7 grams. Conclusions/Discussion In conclusion, people who purchase sulfate-free shampoo should be cautious of what kind they get, because sulfate-free shampoos I tested demonstrated lowering the hair tensile strength. The sulfate-free shampoo had the worst results in strength, which means that sulfate-free shampoo may do some damage to your hair strength. The sulfate containing shampoo showed a higher tensile strength.	
Summary Statement My experiment showed that certain sulfate containing shampoos showed to overall improve hair tensile strength over a control group and sulfate-free shampoos.	
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