



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2019 PROJECT SUMMARY**

<b>Name(s)</b> <b>Mia Isabel Rodrigo</b>	<b>Project Number</b> <b>S0620</b>
<b>Project Title</b> <b>Determining the Relationship between Oxidation Time for Wine and the Amount of Sulfite Remaining</b>	
<b>Abstract</b> <b>Objectives</b> Understanding the chemistry of sulfites is necessary in viticulture and enology. The use of sulfite is important as it is one of the most safest and widely used preservative (Hanna Instruments) throughout the entire food and beverage industry and should consequently be studied as it has some severe effects on people. I hope to determine the relationship between the time allowed for wine to oxidize and the amount of remaining sulfite through filtration. <b>Methods</b> Transfer wine containing sulfite to a 250 mL flask. Ensure that the bottle is closed right away to avoid additional oxidation occurring in the other samples Acidify wine for one hour by placing on stir plate and using magnet. Repeat four times successively. (Label 2-6) While waiting for the wine to acidify, label and take masses of 15 pieces of filter paper. Transfer 50 mL of wine oxidized for 6 hours into 3 250 mL beakers and add 2 mL of 0.2 M NaOH to increase the pH. Add 2 mL of 0.6 M strontium chloride to mixture. Place funnels into a corresponding beaker and fold the filter paper in such a way where no precipitate will escape and pour the mixture through the funnel. Ensure that you rinse the flask with distilled water into the funnel and repeat for the remaining 14 flasks. Leave flasks to dry. Once a couple of hours go by move the filter paper to a test tube rack. Once all the filter papers are completely dry, record the mass. Complete calculations to find the remaining amount of sulfite. <b>Results</b> There is an inverse correlation between the amount of time the wine is exposed and the amount of sulfite remaining in a linear fashion. This correlation is fairly strong as demonstrated by the 0.898 R <sup>2</sup> value. <b>Conclusions</b> My hypothesis was proven correct as my experiment demonstrated that there s an indirect correlation between the amount of sulfite remaining and the level of oxidation. As time progresses when the wine is exposed to air, more oxidation is taking place. Free SO(2) readily reacts with oxygen to inhibit the the wine from being oxidized into ethanoic acid by bonding to the ethanol molecule. The amount of sulfite decreases the longer the wine is exposed to air because more SO(2) binds to the ethanol molecules.	
<b>Summary Statement</b> I used filtration to determine the relationship between the time allowed for wine to oxidize and the amount of sulfite remaining.	
<b>Help Received</b> I asked my teacher for clarification regarding how ksp relates to pH as the concepts are not covered in our curriculum for IB.	