



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Dana A. Mead	Project Number S0522
Project Title Does the Amount of Ammonia Affect Forming Salt Crystals?	
Objectives/Goals I was looking at crystal growth and how it would change if the formula was changed. The regular salt crystal formula works well. If I was to omit ammonia from the formula, would it allow the crystals to form properly? I also wanted to double the amount of ammonia to see if the crystals would form better.	
Abstract Methods/Materials For this project I needed 9 sponges, 9 bowls, Mrs. Stewarts bluing, table salt, ammonia, ruler, marker, camera, mixing glass and measuring spoons. I labeled the bowls IABC, IIABC, IIIABC (3 each) and put the same size sponge in each bowl. Day one I mixed 2TbIs of each: bluing, salt, water, and poured this into IABC. For bowls IIABC, I added 2 TbIs of ammonia to the formula and to bowls IIIABC added 4 TbIs of ammonia to the formula. On day 2, I added 2 TbIs of salt to each bowl. On day 3, I repeated day 1. Don't pour solution on the crystals or they will dissolve.	
Results Group I started forming crystals in 5 hrs. This group had no ammonia and formed crystals that were hard and platelike instead of being soft and fluffy. They only formed .5mm up from the solution on the side of the bowl. They formed crystals up to 2 mm on the sponge and were very sparse. The color was a yellowish tint. There wasn't any formation after 11 days. Group II started forming in 1 hour and it had 2 TbIs of ammonia in the formula. Crystals formed up the side, over the lip, and down the outside of the bowl. Crystals formed up to 3 mm high and were snowwhite, soft, fluffy, and very dense. A lot of crystal sloughed off onto the table. The crystals stopped forming in 11 days. Group III had the same results as group II except the crystals formed to 5 mm high. They started forming slower but ended up forming higher.	
Conclusions/Discussion My conclusion is that the chemical reaction to form salt crystals is very complex. When there is no ammonia there is not the right ingredients to cause a chemical change to form salt crystals that look like the original salt formula, or form many crystals at all. The regular formula had all of the right ingredients to cause a good chemical reaction and formed salt crystals very well. When the ammonia was doubled, the crystals didn't form as fast but they out performed in the end. The amount of ammonia does make a difference in forming salt crystals.	
Summary Statement My project is to see how the amount of ammonia will affect the growth of salt crystals.	
Help Received My grandfather helped gather the materials used and gave me advise on setting up the project.	