



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

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| <b>Name(s)</b><br>Nicholas P. Calta   | <b>Project Number</b><br><br>22212 |
| <b>Project Title</b><br>Corrosion Prevention: Inhibiting Corrosion on Steel   |                                    |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>The purpose of this science project is to find the most effective method to prevent corrosion.</p> <p><b>Methods/Materials</b><br/>The purpose of this science project is to find the most effective method to prevent corrosion. Common steel nails (16d, 8.9 mm) were cleaned with soap and water, sanded, and wiped with alcohol. The nails were then weighed in groups of two and the diameter was measured. The groups were then assigned variables and treated accordingly. The control groups were placed in a sealed jar with desiccant (inert environment), the bare nail samples were placed in water, Painted nail samples were spray painted and then placed in water, greased nail samples were greased with petroleum jelly and placed in water, and galvanized nail samples were two galvanized nails treated the same as the common nails. I let tt samples corrode for 9 days, and after that, I cleaned and weighed the nails. The nails were allowed to corrode another 6 days and weighed them again. I then repeated this procedure three more times.</p> <p><b>Results</b><br/>During my tests, I found that the control samples showed very little change. The bare nails, on the other hand, lost nearly five centigrams. The painted nails gained a centigram in 15 days, the greased nails lost two centigrams, and the galvanized nails lost almost one milligram in the 15-day period.</p> <p><b>Conclusions/Discussion</b><br/>From the results of my experiment, I have found that spray painting and galvanizing steel nails most effectively prevent corrosion over a 15-day period. However, after 9 days in water, the galvanized nails lost more weight than they did after 15 days. I believe that this is due to corrosion of the steel under the galvanic coating that I could not remove. This leads me to believe that if allowed to corrode for much longer, the galvanic coating would stop protecting the steel. I found that leaving a steel nail bare in water creates the most corrosion.</p> |                                    |
| <b>Summary Statement</b><br>My project is about preventing the corrosion of steel   |                                    |
| <b>Help Received</b><br>Fred Cardin of the Guidant Corporation for generously allowed me to use his laboratory balance to weigh my samples. My father for his help in obtaining supplies for my project.  |                                    |