



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Diana M. Palma	Project Number S0615
Project Title Polystyrene and Its Effectiveness in Removing Calcium from Water	
Abstract Objectives/Goals Hard water contains a high concentration of calcium and magnesium ions usually obtained by the mineral build ups in pipes. While not hazardous to Heath, the hard water can cause issues in industrial settings. Filters used in treatment are very expensive, short term, not very effective. My goal was to determine is polystyrene could be a viable material to be used in the process to remove water hardness. Methods/Materials Materials -polystyrene (styrofoam and soda dividers) - sulfuric acid -EDTA First I tested the hardness of the water samples created using titration. Then created the polystyrene resin using sulfuric acid and agitating it for varied time. I then tested that resin against a reverse osmosis filter which was my control, by titrating samples passed through the filters. Results The average amount of .01 M EDTA Solution used in the test with the polystyrene filter and the reverse osmosis filter will determine how effective the polystyrene filter is. Through the data collected it is revealed that the both polystyrene filters have a lower average of EDTA usage compared to the reverse osmosis filter which is the control. The lower the amount of EDTA, the quicker the reaction reached the endpoint which means that the calcium transformed into chelates faster. This means that the polystyrene removed the calcium because there were less calcium ions in the sample than reverse osmosis sample Conclusions/Discussion In conclusion, my experiment the polystyrene was a more effective material to use in a filter. For both samples the EDTA was lower than the control which means that more of the calcium was removed. In the future, I plan to further the project by utilizing the data and the information collected to create a filter usable for large scale.	
Summary Statement Determine if polystyrene is a viable option to remove calcium from water.	
Help Received Received help from Dr. Grant in lab.	