CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J1910

Project Title
Effectiveness of Fire Retardant Paints

Abstract

Objectives/Goals
When I found out that there were types of house paints that could protect a home in the case of a fire, I wanted to see if the paints really worked. In California in the fall, Santa Ana winds cause wildfires all over the state. Any protection that one could offer a home should be considered. The purpose of this test was to see if fire retardant paints were truly effective. The idea of these paints is that the paint exposed to the heat will #puff up# providing a carbon barrier to block the fire#s fuel supply. Based on my research, I believed that the fire retardant additive would be most effective.

Methods/Materials
I tested a fire retardant house paint that was pre-mixed and a paint additive that could be mixed into any plain, water-based, latex paint. For my control samples, I tested the same latex paint and plain cuts of Douglas fir. I burnt each plank of wood with a blow torch at approximately 1300 degrees Fahrenheit for a minute from 5 cm. After a minute I removed the blow torch and timed how long it took for the fire to extinguish itself.

Results
Unexpectedly, all the wood samples did not burn as much as I had predicted. I found the pre-mixed paint lost an average of only one gram and took an average of only 0.14 sec. to extinguish itself. The paint additive samples had about the same amount of weight loss as the wood with ordinary latex paint. These samples lost about three grams on average. The fire retardant additive samples took approximately 5.5 sec. to extinguish itself. The ordinary latex paint took approximately 6.5 sec. to extinguish itself. The wood with no paint lost an average of four grams and took approximately 6.75 sec. to extinguish the flames. In order to obtain a more significant weight loss in the wood samples, I set up a second testing where I burned twenty-eight more wood samples and for two minutes at a closer distance of 2.5 cm.

Conclusions/Discussion
According to my findings, the factory mixed fire retardant paint was most effective in stopping the fire and its spread. I also found the fire retardant paint additive was effective and that a flat latex paint also provides some fire protection compared to plain wood. If I were to do this project again, I would try to control the humidity and see how it affected the burning of the wood samples. I recommend using a fire retardant paint if you live in Southern California because it might save your home from a wildfire.

Summary Statement
The purpose of this project was to determine whether fire retardant paints were truly fire resistant when applied to wood and exposed to a flame.

Help Received
I would like to thank my father for driving me to Home Depot and for supervising my testing. I would like to thank my mom for helping me with my board. I would like to thank my science teacher for her advice and help with my project.