CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)
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Project Number
J2199

Project Title
UV Detection for Medicine Protection

Abstract

Objectives/Goals
To determine which type of medicine pill bottle is most effective in blocking UV rays.

Methods/Materials
Equal amounts of UV beads were placed in a plastic bag (control) and 5 different types of medicine pill bottles (clear, orange, white, green, and brown in color). They were placed in 3 different locations (indoors/fully shaded, on a window sill/slightly shaded, and outdoors/direct sunlight). The bottles were left for 1 minute in each location. After 1 minute, color change in the UV beads was recorded by a single person.

Results
The brown pill bottle blocked all UV rays. The beads contained within the bottle showed no color change in all three locations. The orange and green bottles both blocked some of the UV rays. Only a few of the beads within the bottles showed a color change when exposed outdoors. In the white pill bottle, the beads steadily changed in color as the amount of sunlight increased in the different locations. The clear bottle and plastic bag (control) did not block any UV rays and their beads were able to change color upon exposure. These results are recorded in the chart and depicted in the photographs.

Conclusions/Discussion
Using UV beads inside the different pill bottles as a substitute for medicines, the experiment showed that the brown pill bottle blocked the largest amount of UV rays. This was followed by the orange and green pill bottles, then the white bottle. The clear bottle and plastic bag (control) blocked the least amount of UV rays. In conclusion, the damaging effects of UV rays on medicines as reflected in the color change of UV beads can be prevented by using the brown pill bottle which blocked the largest amount of UV rays regardless of storage location

The limitations of the study relate to weather conditions and the kind and quality of the UV beads. Depending on the weather, the strength of UV rays may differ. Certain color UV beads are more sensitive than others.

Summary Statement
Using UV beads as a substitute for medicine, I will be able to test how effective the UV protected plastic in pill bottles is in preserving the medicines.

Help Received