CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
S0507

Project Title
The Effects of FD&C Blue #1 on the Reaction Time of the Cyanoacrylate Fuming Latent Fingerprint Experiment

Abstract

Objectives/Goals
The purpose of this experiment was to determine if the concentration of FD&C Blue #1 would effect the time it took a latent fingerprint to become visible in the Cyanoacrylate Fuming Method test.

Methods/Materials
A fuming chamber was created. A controlled technique for fingerprinting was established. Control fingerprints were taken in black ink on microscope slides. Latent prints were made on microscope slides, then added to the chamber along with superglue, boiling water, and depending on the trial, the coloring agent. Then the lid was closed and the fume timing was started. A control trial was done without the coloring agent, then three concentrations of FD&C Blue #1 were tested. For each trial 3 slides were tested.

Results
It was found that as the concentration of the FD&C Blue #1 increased, the reaction time increased. On average, when the concentration was doubled the average reaction time for a fingerprint to be developed was increased by four and a quarter minutes. It was found that trial 3, which was conducted with a FD&C Blue #1 concentration of 20%, had the lowest percent deviation at 4.22%. The control group, which contained a 0% concentration of FD&C Blue #1 had the second lowest deviation at 7.78%.

Conclusions/Discussion
It was found that in this particular experiment, as the concentration of the FD&C Blue #1 increased, the reaction time increased also. These results fit the expected outcome because based on the chemical formulas, the FD&C Blue #1 would not have reacted with the Superglue and the humidity to produce the same Cyanoacrylate gas that is known to be attracted to the trace elements of amino acids, fatty acids, and proteins. Therefore, it would have inhibited the reaction from occurring naturally and slowed it down. Also, as the concentration of FD&C Blue #1 increased, the overall fingerprint quality decreased.

Summary Statement
This project tested the effects of various FD&C Blue #1 concentrations on the time it took a latent fingerprint to become visible in the Cyanoacrylate Fuming experiment, as well as the overall quality of the resulting fingerprint.

Help Received