

## CALIFORNIA STATE SCIENCE FAIR 2005 PROJECT SUMMARY

Name(s)

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**Project Number** 

**J1106** 

## **Project Title**

# Can Various Laundry Detergent Additives Affect the Flammability of Fire Resistant Fabric?

## **Objectives/Goals**

### **Abstract**

The objective of this project was to determine if washing fire resistant fabric, such as children#s sleepwear, with different laundry detergent additives, such as fabric softener or dryer sheets, could affect the flammability of the fabric. It was hypothesized that the children#s sleepwear washed with the combination of Tide unscented liquid detergent, Downy liquid fabric softener, and Bounce dryer sheets would have the highest flammability, or burn rate.

#### Methods/Materials

Five identical children#s sleepwear outfits were used to test the burn rate. One garment was not washed at all and was immediately cut up into fifty 1x3 inch strips. These strips were then individually burned and timed to calculate the ignition time. Another garment was washed with Tide detergent, then cut up into fifty 1x3 inch strips, burned and then timed for ignition after 3 washings, 7 washings, and 10 washings. These steps were repeated with the sleepwear washed with Downy fabric softener, the sleepwear washed with Bounce dryer sheets, and the sleepwear washed with the combination of Tide detergent, Downy fabric softener, and Bounce dryer sheets.

#### Results

The sleepwear washed with the Downy fabric softener and the sleepwear washed with the Bounce dryer sheets both ignited the quickest overall at about 5 to 6 seconds. The sleepwear that was washed with the Tide detergent ignited the slowest on average, at about 9 seconds. The sleepwear that was not washed at all, which was the control, ignited at approximately 2 seconds.

#### **Conclusions/Discussion**

The results did not support the hypothesis in this particular experiment. The sleepwear was found to be more flammable when washed with additives individually. This information directly relates to the subject of burns suffered by a child because of the clothing that they were wearing at the time of a fire. Washing a child#s sleepwear with fabric softener or dryer sheets could in fact increase the child#s chances of more serious burns or death if the sleepwear is exposed to flame.

#### **Summary Statement**

The affect of laundry detergent additives on the flammability of fire resistant fabric.

#### **Help Received**

Parents supervised the burning of the fabric strips.