

The Effect of Common Cleaning Products on Presumptive Blood Testing Kits

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Hypothesis: Cleaning products can result in false-positive, false-negative, or inconclusive results on different types of presumptive blood tests.

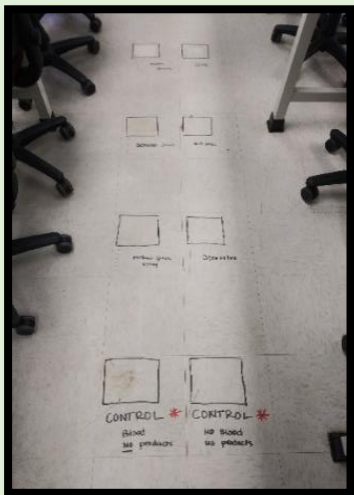
In this study, **Phenolphthalein (PT)**, **Leucocrystal Violet (LCV)** and **Tetramethylbenzidine (TB)** presumptive testing kits, and **Hydrogen Peroxide (H₂O₂)** were used on tiles cleaned with common cleaning products: Method® glass cleaner; Dawn Essentials® dish soap; Wet Ones® disinfecting wipes; Citrasolve® cleaner and degreaser; HDX® citrus degreaser; and Mean Green® degreaser and cleaner. The objective was to determine the effect that each cleaning product would have on the presumptive blood tests.

Interpretation based on Current Chemical Understanding

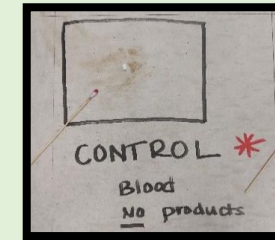
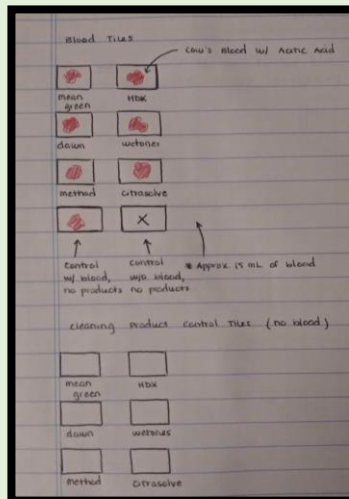
LCV has cationic properties that likely reacted with the anionic properties of the Citrasolve®. When anionic and cationic ions interact, they fall out of solution and are no longer effective.

The Mean Green® Degreaser and Cleaner contained Sodium Edetate as a chelating agent. This agent is responsible for bonding to metal ions and limiting their reactivity. The Fe²⁺ within oxidized red blood cells likely bonded to the degreaser and interfered with the LCV presumptive test.

TB reacts with the Mean Green® Degreaser according to Fenton's Reaction. With Hydrogen Peroxide as an oxidizing agent, it is reduced through Fe²⁺. The chelation agents within the cleaner likely interfered with the reactivity of the Fe²⁺ ions.



Experimental Set-Up in Laboratory, Summer 2020



Control Tile Set-Up in Laboratory, Summer 2020



Presumptive Blood Test Kits, Summer 2020

Conclusion: This research has shown that, with the Leucocrystal Violet (LCV) presumptive blood test, Citrasolve® and Mean Green® both yielded false negative results. The Tetramethylbenzidine (TB) presumptive blood test yielded false negative results with Mean Green®. **This and further research studies will better equip crime scene professionals to identify crucial blood evidence.**

