Toxic Residues and Unsuspecting Clients: Developing a Test Kit for Identifying Illicit Laboratory Wastes

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The goal of this project was to create a relatively inexpensive test kit which identified the previous existence of a methamphetamine laboratory by detecting lithium carbonate residues. Due to lithium carbonate's LD50, it should be identified to at least 2.04M and preferably past 5.37x10-1M. During Experiment I a lithium carbonate dilution series was created, and each concentration was burned. A spectrometer was used to read the intensity of the red emitted by the flame. The experiment was stopped after 1x10-4M lithium carbonate was burned since no red flame was observed. Another lithium carbonate dilution series was created during Experiment II, and each solution was poured on a glass surface. Distilled water was used as a negative control. Once the solutions had evaporated and left behind a residue, different solvents, which included 5% acetic acid, 5% hydrochloric acid, and distilled water, were used to soak up the residues onto filter paper. The filter paper was burned, and observations from the naked eye and through a red glass filter were recorded. The experiment was stopped after 1x10-5M lithium carbonate was burned since no red flame was observed after the 1x10-2M solution. Both experiments identified lithium carbonate past 5.37x10-1M, although Experiment I was more successful due to the filter paper's combustion hiding the red flame in Experiment II. Differing solvents and observation techniques had no effect on the flame test. Sources of error included parallax error, inoculating loop contamination, and differing times of exposure between the saturated filter paper and lithium carbonate residues.

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