

Abstract

Caught Red-Handed! The Effect of Elements on the Color of Fire

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The effect that elements have on the color of fire is a valuable resource. This lab was performed to test how elements can alter a flame's color and intensity in order to determine the element tested. The hypothesis that if lithium chloride can make fire change color, then we can determine if a substance contains this element, and the quantity of the element because the color of the energy the atoms emit when they come down from an excited state will reveal the element, and the brighter the color, the more concentrated the element, was created after researching. Two LiCl solutions were made, one with 1 g LiCl/40 mL of water and one with 2 g LiCl/40 mL of water. A tubing system was created by attaching two tubes, one to the exhaust port of a vacuum pump pointed at the burner, and one in the solution. The test results were recorded with a spectrophotometer and graphed with the Venier Spectral Analysis app. As the amount of LiCl increased, the red wavelength on the graph gained intensity, going from an average intensity of 0.017 to 0.019. When a Two-Way ANOVA test was performed, it showed the P-value representing the difference in intensities was significant ($P=0.026$). After both solutions were tested, the table showed that the red wavelength's intensity increased by 14.59% when the amount of LiCl was increased by 1 g. This technique is an incredibly useful asset for identifying elements in the science field.