The Effect of Ultraviolet Light on the Chemistry of Gatorade

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This project tests how Gatorade reacts when exposed to UV light, which will be simulated by a UV lamp designed to replicate the effects of sunlight. The independent variable in this project is how long the Gatorade has been exposed to UV light, but another independent variable I will test is whether or not certain colors/flavors of Gatorade absorb more UV light than others and also whether or not having a cover helps protect the Gatorade. I will quantify these reactions by measuring the changes in temperature, acidity, electrolytes and these will be my dependent variables. Changes in temperature, which was measured with a thermometer, and acidity, which was measured with a pH sensor, will determine the change in the Gatorade's taste and decay. Because electrolytes are charged particles that carry current in solution, the conductance of the solution is directly proportional to the concentration of the electrolytes. Changes in current were measured with a multimeter, which will determine the change in the Gatorade's electrolyte content and hence its ability to replenish fundamental nutrients. The hypothesis is that If Gatorade is exposed to ultraviolet light for one hour, then it will lose more than 25% of its electrolytes, increase in acidity by more than 25%, and increase in temperature by 25% as a result of absorbing the ultraviolet radiation. In conclusion, the data supported the hypothesis: ultraviolet light had a significant effect on the Gatorade as on average the temperature increased approximately 32% for covered solutions and 52% for uncovered solutions, the acidity increased approximately 52% for covered solutions and 85% for uncovered solutions, and electrolyte content decreased approximately 32% for covered solutions and 63% for uncovered solutions.

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