Engineering an Automated Chloramine Testing Device

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Most people are familiar with a distinct chlorine smell that they often detect around an indoor pool. However, most are unaware when they detect this smell, they are actually inhaling a dangerous compound called chloramine. Chloramine is known to cause negative health effects to those that inhale it high concentrations, such as damage to the lung's Clara Cell System, its natural defense to trace amounts of toxic gases. A correlation has also been shown between exposure to chloramines at a young age and the development of asthma later in life. However, despite these known health risks, most natatoriums are not equipped with dependable systems to remove the chloramines from the air. The goal of my project was to create a low cost device that could test and remove chloramines from the air of indoor pools, while also remaining cost effective and practical for the setting. The device was designed to automate a system of testing, called the DPD test, which is traditionally performed by hand. An Arduino microcomputer was used to automate this method, using an LED and photoresistor reading to test the color of the different solutions in the test. The device was ultimately successful at meeting the engineering goal, after several improvements and modifications. The devices provides accurate readings chloramine concentrations before sending a single to the pools HVAC systems to control an exhaust fan. Therefore, the device has been shown to be an effective product to mitigate the negative health effects caused by the inhalation of chloramines.

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