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Optimization of Simple and Inexpensive Paper-Based Assay for Lead

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Title: Optimization of Simple and Inexpensive Paper-Based Assay for Lead

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Abstract:

The Environmental Protection Agency (EPA) guidelines state that lead is a toxic metal that humans should not be exposed to in any amount. Due to corrosion of water pipes, lead can enter drinking water and be consumed by millions of people. As a group, we decided to reduce this issue by creating a simple and inexpensive paper-based test to detect lead(II) in water. The signal for this test results from encapsulating a phenanthroline-based probe in synthesized polymer nanoparticles. This test will display a colorimetric change, turning from yellow to bright orange if lead(II) is present in the water system. In an attempt to optimize the response of the test, different variables were adjusted to analyze the nanoparticles' effectiveness. In this work, polymer type, polymer concentration, solvent, probe concentration, and synthetic method were explored and the optimal method for lead(II) detection was determined. Future directions for our research include focusing on the selectivity of the test to confirm it does not respond to other metals, such as copper and zinc, and optimizing the attachment of the nanoparticles to the test strip itself.

Tags: Chemistry, Environment, Nanomaterials, Water Quality

Category: Oral Presentation