NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Quantitative Determination Of Pollutants In Wastewater

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Abstract

In this modern world, it has become imperative to control and monitor the environment in order to avert potential disasters in the near future. Several global bodies have been formed and most of them are lobbying for good environmental practices that include the safe disposal of waste, in particular industrial waste. Therefore, it is now important to try and employ analytical methods that may quantify the amount of pollutants in water bodies in our respective environments.

This project presents the analysis of wastewater samples that were collected from various places in and around the city of Bulawayo and Bindura town. The pollutants that were studied are, Na^{+}, Ca^{2+} and I_2, since light sources that emit in their absorbing regions were available from our laboratory. Although the number of pollutants that were studied was not extensive, the initiative will certainly pave way for comprehensive future research in this aspect of science.

Absorption spectroscopy technique was employed in the analysis of the collected samples for the determination of the concentrations of pollutants (Na^{+}, Ca^{2+} and I_2). Calibration graphs of the standard solutions of the pollutants were constructed and the concentrations of the pollutants in the samples were found by reading-off from the graphs. The concentration of Na^{+} varies from $8.65 mgdm^{-3}$ to $308.17 mgdm^{-3}$, Ca^{2+} concentration varies from $3.46 mgdm^{-3}$ to $427.10 mgdm^{-3}$, while I_2 concentration was found to vary from $0 mgdm^{-3}$ to $16.36 mgdm^{-3}$.

The results that were obtained give important information in as far as environmental control and monitoring is concerned, and corrective measures should be put in place and implemented. From the results, it was found that very high concentrations of pollutants were commonplace near mining and industrial areas.