DETECTION AND QUANTIFICATION OF MAGNESIUM IN BIOLOGICAL SAMPLES
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Abstract
Among its many functions, magnesium is of critical importance in maintaining the mineral homeostasis in the lens of the human eye. Cataracts, the leading cause of blindness, is a disease which occurs due to a loss of transparency in the lens. This loss of transparency may have causes rooted in the onset of an imbalance in intracellular ionic concentrations, especially including magnesium. Therefore, developing a reliable and accurate method for the quantification of magnesium in cataract samples would allow for further insights into the process of cataract formation. This method that has been developed in this project utilized xylidyl blue I as the indicator, as well as E. Coli samples to mimic the biological matrix of cataract samples in order to optimize the parameters for quantification. This method has so far been found to have a limit of detection of 0.785 ppm.

Discussion

Table 1: Optimized Parameters
| Xylidyl Blue Concentration | 60 ppm |
| Triton Concentration | 10% |
| Heat Block Time | 30 minutes |

- Further testing will be performed to ensure reproducibility of these results with these parameters.
- The calibration curve indicated a linear trend from 0.1 ppm to 2.0 ppm Mg concentration.
- The slope of the calibration curve allowed for a limit of detection of 0.785 ppm.

Future Aspects
- Adjustment or addition of new parameters will be made to improve the limit of detection.
- Eventually, this model of quantification of magnesium in E. Coli will be utilized to quantify magnesium in cataract samples.

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References