

**DETECTING AND MEASURING CONCENTRATION OF UREA IN THE BLOOD  
USING AN ELECTRONIC SENSOR**

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## STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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## ABSTRACT

### DETECTING AND MEASURING CONCENTRATION OF UREA IN THE BLOOD USING AN ELECTRONIC SENSOR

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People who suffer from chronic kidney disease require the use of hemodialysis. The monitoring of blood urea concentration during therapy is important to evaluate the progress of therapy. The higher the concentration of urea in the blood, the more lethal it is for the patient. Urea is broken down into ammonia and carbon dioxide with the help of enzyme urease. High concentrations of ammonia in the blood can further damage the kidneys. Ammonia ions dissolved in the blood can be detected using a potentiometric conductivity sensor. The sensor has two electrodes that detect changes in electrical potential difference between them. Results show that as the concentration of ammonia dissolved in distilled water increases, the conductivity of the solution increases. On the other hand, an increase in ammonia concentration dissolved in diluted blood would show a decrease in conductivity. This shows that ammonia has an effect on a solution's overall conductivity, but not as much as the difference caused by blood. The undetected changes made by ammonia in diluted blood can be calculated, and these values can be referred as the fixed relation of ammonia concentration and solution conductivity.

*Keywords: Chronic Kidney Disease, Hemodialysis, Potentiometric, Conductivity.*



## **DEDICATION**

I dedicate this work to my family, for whom I cannot love enough, my Lecturers, for whom I cannot thank enough, and my friends, for whom have all been there for me regardless of the time, place, and condition.



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