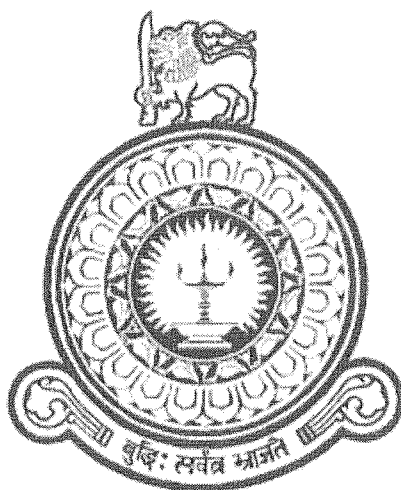


M.Sc. AC 173

Application of nanomaterial for removal of heavy metal and non metal ions from contaminated water



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ABSTRACT

In the 21th century safe drinking water is the major problem in the world due to the rapid urbanization and industrialization. This rapid change causes contamination of water with heavy metals and non metal pollutants. Sometimes heavy metals and non metal can enter to the environment through natural processes. However safe drinking water is even harder to find in the future and drinking water should always be clean and free of contaminants to ensure proper health and wellbeing. In Sri Lanka context fluoride is one of the major problems, specially in dry zone. Fluoride in high doses has been proven dangerous to be health and can provoke a potentially highly disabling disease, namely fluorosis. Scientists face this difficulty and day by day develop method to overcome this difficulty. But existing water purification methods are not environmental friendly and cost of purification is very high. Furthermore, during the purification process many other chemicals come into the water body.

In This research, we propose low cost and environmental friendly method for water purification. It based on nano technology and in purification process chemical contaminants reached to zero. The reason for that is this method did not use any chemicals for water purification. In this method, basically porous structure comprised of iron oxide nano materials and nano composite devices were used. The device was made with iron oxide nano particles, rice husks and white clay. Therefore this method is low cost, environmental friendly and easy to handle.

In this study, ceramic devices were tested for their ability in purification of water, when contaminated with Arsenic, Lead and Fluoride. The proposed method does not rely on chemicals. Instead, a porous structure comprised of ironoxide nano materials and nano composite, rice husks and white clay was used for water purification. The results implied efficiency and accuracy of this application. In this method, Role of the rice husks is to improve the porosity of the matrix. Further this method was limited to small size of ceramic devices but this application can be improved to large size of ceramic devices (candles). After the improvements it can be used in domestic and industrial water purification process.