INVESTIGATION OF NONTOXIC NANO CLAY COMPOSITE IN ORDER TO REMOVE PERMANENT WATER HARDNESS

Kaluperumage Ayodhya Panchala De Silva1

Nalanda College, Siri Dhamma Mawatha, Colombo 10, Sri Lanka1

Nano and Advanced Material Research Group, Department of Chemistry, Faculty of Applied Sciences, University of Sri Jayawardhenapura, Nugegoda, Sri Lanka1

**Introduction:**

Being an island in the Indian Ocean, Sri Lanka is blessed with many sources of water. Water found in most of the places in Sri Lanka is polluted due to the environmental pollution, urbanization, increase of the population, usage of fertilizers, pesticides and weedicides in agricultural activities causing Chronic Kidney Disease of unknown etiology and cancer to those who are drinking water. When surface water sources are polluted, the use of ground water will increase. A major consequence of ground water (especially in dry zones ) is water hardness. The simplest deﬁnition of water hardness is the amount of dissolved calcium and magnesium in water. According to WHO (World Health Organization) guidelines, 00 – 60 ppm of calcium carbonate is normal water (drinking water) 60 – 120 mg/l concentration of calcium carbonate in water is moderately hard, 120 – 180 mg/ l concentration is hard and more than 180 mg/l is very hard and it is called as the permanent hardness.

**Summary of the Project:**

Kaolinite clay disk which modiﬁed was synthesized by blending chitosan bio – polymer by using a facile and novel water assisted mechanochemical grinding and its eﬃciency in hardness removing was reported. The eﬃciency was tested with EDTA titration. When comparing the hardness removal capacity between pure kaolinite and kaolinite modiﬁed with chitosan, latter one shows 09 times higher absorption capacity than ball milled. Thus, our kaolinite clay disk modiﬁed with chitosan was interpreted successful removal of hardness giving ions from water.

**Conclusion:**

As it has a good adsorption capacity we can use this nontoxic material to ﬁlter hardness of water. According to the above results kaolinite modiﬁed with chitosan has a good removal percentage and it is above 96.83%. Because of that we can u this nano clay composite to remove permanent hardness from water.

**Key Words:**

Permanent water hardness, Nano clay, Composite, Chronic Kidney disease of unknown etiology, Filter system.