AMMONIA REMOVAL FROM SURFACE WATER IN WATER PURIFICATION PLANTS ON ROSETTA BRANCH

Submitted By

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B.Sc. of Science (Chemistry), Faculty of Science, Azhar University in Cairo, 2005

Diploma in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2010

A Thesis Submitted in Partial Fulfillment

Of

The Requirement for the Master Degree

In

Environmental Sciences

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APPROVAL SHEET

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ABSTRACT

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Rosetta branch is a source of fresh water for domestic, agriculture, industry, fisheries and tourism purposes for some western Delta governorates in Egypt. Unfortunately this branch is impacted by increasing concentrations of ammonia resulted from the agricultural drains located along its sides, fish farming cages and domestic waste from villages which have no sanitation system. This study aims to monitoring ammonia, dissolved oxygen, nitrite and nitrate concentration along the Rosetta branch and their impact on water purification plants intakes and investigates the potential application of rice straw and de-aluminated kaolin for removal of ammonium ions (NH_4^+- N) from water in water treatment plants. Water samples were taken at an interval about 5 Km of the branch. Recorded ammonia ranged from 0.16 to 9.4 mg/l. Levels of ammonia in Rosetta branch are very high after mixing with Rahawy drain, as it reached 6.77 mg/l and decreased gradually along the Rosetta branch to the lowest level of 1.14 mg/l at Basion WTP due to dilution along the branch and increased again, due to presence of fish cages in Gharbiya, Kafrel-sheikh and Behaira governorate although the national law prevents strictly using of waterways or fresh water in this activity. This thesis investigates the capacity of acid and alkaline activated and non-activated rice straw and de-aluminated kaolin to retain ammonium ions from water. Up to 60% removal of ammonia has been accomplished using 2 g of DAK 0.08mm for 150 minutes of treatment. This study has studied the using of RS as an alternative material to remove ammonia from the water. It was reported that, RS achieves about 30 % removal percent meanwhile the modified RS_{NaOH} reached to about 50 % removal percent.

Keywords: *ammonia removal; Rosetta branch; water treatment; wastewater treatment; fish cages; rice straw; de-aluminates kaolin; Rahawy drain.*

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