Department of Chemical Engineering and Polymer Science
Shahjalal University of Science and Technology
Sylhet-3114, Bangladesh

Scholarship Notice

Research Student (Masters)

Number of scholarships = 1 (One)

This masters' scholarship is available to university graduates who wish to undertake postgraduate studies at Department of Chemical Engineering and Polymer Science, Shahjalal University of Science and Technology, Sylhet 3114, Bangladesh. This scholarship will be funded by Bangladesh Bureau of Educational Information & Statistics (BANBEIS), Ministry of Education, Government of the People's Republic of Bangladesh under the project ID SD2017530 titled 'Automation and control of nitrogen removal as well as reduction of greenhouse gas (N_2O) emission from high nitrogen contain wastewater'.

Duration of the Scholarship: 1 (one) year

Scholarship amount: 10.000 (Ten thousand) take per month

Starting of the project: 1st January 2019

Interested graduates on chemical engineering/applied chemistry/chemistry/civil engineering or related subject are requested to apply with CV to the address below before 30/11/2018.

Contact details:

Prof. Dr. Md. Salatul Islam Mozumder
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Summary of the project:

Growing industrial and agricultural development increased a number of human activities and produce nitrogen containing wastewater. High strength nitrogen containing wastewater originates from manure, landfill leachate, several organic chemicals; plastics and synthetic fibers industries, sludge and bio-gas digester supernatants which are growing exponentially in Bangladesh. Uncontrolled disposal of these wastewater causes a huge damage to environment with producing a number of intermediates such as nitrate (NO_3^-), nitrite (NO_2^-) which have high toxicity to aquatic animals as well as human and nitrous oxide(N_2O) which is a strong greenhouse gas (300>CO_2). N_2O can contribute significantly to carbon footprint of the wastewater treatment plant (WWTP), e.g. accounting for the 78% of the total greenhouse gas emissions (CO_2 equivalents). Because of its high global warming potential (298-CO_2 equivalents) and its negative influence on the ozone layer, a lot of attention is paid to the reduction of N_2O emissions from WWTP.

Salatul Islam 11.11.2018

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One of the major challenge, to efficiently removal of ammonium-nitrogen is implementation of automatic control, otherwise there are possibility to accumulate nitrite, nitrate or to emit high amount of N_2O. This research is about realizing lab-scale control in WWTP using in-situ sensors which measure the key parameters in ammonium-nitrogen removal processes, i.e. oxygen and organic substrate concentration. In-situ measurement results a short dead time, hence making simple feedback control loops based on proportional and integral actions. The optimal process parameters will be reached based on lab-scale experiments, where various control structures will be tested. By controlling process parameters; temperature, oxygen concentration and organic substrate at its optimal level, it is possible to significant improvement conventional nitrification-denitrification process for the removal of nitrogen (ammonium, nitrite and nitrate) from ammonium rich wastewater as well as reduce the greenhouse gas (N_2O) emission. Success of such project will give birth a 'sustainable wastewater treatment technology'.

Salatul Islam 11.11.2018

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