**A STUDY TO DETERMINE THE CHEMICAL SPECIATION OF IONS IN ANAMMOX REACTOR**

**ABSTRACT**

Nitrogen is one of the main pollutants in wastewater. Countless technologies in treating nitrogen compounds have been developed. Among these processes, Anammox (Anaerobic Ammonum Oxidation) process has the potential to be one of the most cost effective processes. In anaerobic settings, the anammox process converts ammonia to N2 while NO2– acts as an electron acceptor. The procedure with a high nitrogen removal rate conserves oxygen and organic carbon. However, anammox bacterium is very susceptible to external conditions and is quickly suppressed. Changes in pH, salinity, temperature, etc. often have an influence on anammox bacteria.

In this work, the inhibition of the Anammox process by heavy metals was examined. The partitioning of heavy metals between solid and bulk phases impacts their bioavailability to Anammox bacteria and, therefore, their toxicity. For modeling, chemical speciation software (Visual MINTEQ) was used to predict the chemical speciation and behavior of heavy metals inside the Anammox reactor. By the software heavy metal free-ion concentrations were simulated. The program was provided information on the wastewater composition, heavy metal concentrations, temperature, and pH. By running the model at a variety of temperatures, pH values, and concentrations, the influence of these factors on the chemical speciation of heavy metals was comprehensively analyzed.