PROJECT ABSTRACT

Water pollution preventing is one of the main challenge for contemporary environmental protection and entails the need of the efficient wastewater treatment. Currently, the emphasis is on the most environmentally friendly biological methods, which include the anammox (anaerobic ammonia oxidation) process. It is characterized by high efficiency, low exploitation costs and low emission of greenhouse gases. An obstacle to its common use is relatively high optimal temperature (30-40°C), which is much higher than average wastewater temperature. Effective cold anammox process performance (10-15°C) would allow for its widespread application and the use of its benefits.

Use of nanomaterials could be an innovative solution. Nanomaterials are particles between 1 and 100 nanometers in size. The most promising are:

- reduced graphene oxide (RGO),
- active carbon (AC),
- divalent ferrous ion (Fe (II)),
- manganese oxide (MnO_2).

Thus, the main objective of this project is to evaluate the possibility of developing a cold anammox process with appropriate nanomaterials addition. Planned project will be divided into five tasks, which will give extensive knowledge about possibilities of developing a cold anammox process with nanomaterials addition. From basic short-term effects research and mechanisms of stimulation and inhibition, through long-term effects in laboratory scale technological system, up to application for real wastewater treatment. Obtained results contribute to environment and economy. Scientifically the results will contribute to expand the knowledge about cold anammox supporting process and show new area of nanobiotechnology.