Eco-friendly Ceramic Membrane Bioreactor (MBR) Based on Recycled Agricultural and Industrial Wastes for Waste Water Reuse (REMEB)

Alpagut Kara

Anadolu University, Department of Materials Science & Engineering, Eskisehir, Turkey Ceramic Research Center (SAM) Inc., Eskisehir, Turkey

Keywords: REMEB, ceramic membrane, olive oil wastes, ceramic wastes, marble wastes

REMEB (Recycled Membrane Bioreactor) is a Research and Development project funded by the European Commission under grant agreement No. 641998, in the framework of the call H2020-WATER-2014. It is a project for first market application developments. With a total budget of 2,361,622.50 EUR, it has a duration of three years, started in September 2015 and concluding in August 2018. The main objectives of the REMEB project are the implementation and validation of a low cost recycled ceramic membrane bioreactor (MBR) for water reuse in a Wastewater Treatment Plant (WWTP). Wastewater treatment through the use of a membrane bioreactor (MBR) can be an exceptional alternative to increase the reclaimed water as a worldwide habitual application. The main problem of the current MBRs, using inorganic membranes, is the high running and maintenance costs of the technology. REMEB project proposes a new type of MBR which will significantly decrease the cost of the technology. In this sense, the project will develop a ceramic, ecological and competitive MBR for municipal and industrial wastewater treatment plants (WWTP), from ceramic raw materials and byproducts and agro-industrial wastes. As a first approach, the low cost ceramic membranes will be developed in Spain with typical raw materials used in the ceramic tile industry like chamotte from fired tile scrap and wastes obtained in agricultural and industrial processes such as olive oil solid wastes and marble working wastes. Then, the membrane will be replicated at a pilot scale in Turkey and Italy, being also ceramic strategic areas, by using recycled materials and wastes products available in these countries. The differences between manufactured membranes will be examined. Seven work packages are established for REMEB project. For the replication studies; SAM is responsible for researching different wastes from Turkey and their characterization. Especially, SAM has been working with fired tile scraps, olive oil wastes and marble dust. This invited paper will report on the results achieved in the project up till now.