Phenolic wastewater degradation by AnMBR

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**Project duration**  4-6 months (January/July 2017)

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**Project proposal**

**Introduction**

Industrial and chemical wastewater are produced every day in huge amounts. These wastes pose a big challenge to the conventional wastewater treatment systems due to their composition, which have a high concentration of toxic and recalcitrant compounds. One example of these type of effluents are the one that came of the coal gasification.

Phenol and phenolic compounds can be considered as the main pollutants of the coal gasification wastewater. Although phenol can be biodegraded, high concentrations can disrupt the biomass of the reactors, promoting the death and washout of the main microbial population in charge of the bioconversion of the pollutants.

The anaerobic membrane bioreactor (AnMBR) is a technology that rises for tackling the above mentioned problems, due to the membrane that is coupled to the system, the AnMBR ensure a complete biomass retention providing the necessary characteristics for development of the necessary microorganisms.

**Experimental description**

- Batch tests for research the anaerobic degradation of phenol, p-cresol, and resorcinol.
- Physicochemical characterization of the biomass and permeate (treated wastewater): solids determination, phenol determination, EPS, particle size distribution, COD (chemical oxygen demand), HPLC analysis, gas chromatography.
- Biochemical characterization and test: SMA (sludge methanogenic activity).
- Molecular biology analysis of the microbial population.

**Requirement**

Active, responsible and smart candidates with willingness to work are required. A background in chemistry, biochemistry, chemical engineering, microbiology or related are preferred. Strong background in chemistry and lab work are also preferred. English communication skills (reading, writing and speaking) are required. Desire to learn, listening capacity and ability of team working in a multi- and inter-disciplinary environment. For master students: independency and proactiveness with analysis and synthesis abilities are looked.

If you would like to enroll yourself for an internship, send an e-mail to our secretaries: secr-gez-citg@tudelft.nl