**Master Project Position**

**Improving Biomethane Productivity and Quantification by Process Simplification**

**Goal of the project:**

Biological methanogenesis is a promising process to integrate in the renewable energy picture of this 21st century. Due to the versatility of biology, biological methane production offers an alternative to existing methanation process or “SABATIER process” widely used in chemical engineering. This project will be centered on optimizing process productivity and simplification of process demand.

The organisms used are hydrogenotrophic methanogenic archaea’s which are grown autotrophically by deriving their energy from the reduction of CO$_2$ with H$_2$ while producing CH$_4$ and H$_2$O. This project offer the possibility of working and understanding the difference in behaviour of gaseous limited cultures where improving mass transfer is directly linked to process performance. This mass transfer enhancement will have to be done by a Design of Experiment approach (DoE) while maintaining compatible physiological parameters for the organisms growth.

In addition a gas chromatography (GC) method will be implemented for online gas quantification. Volatile substances are best separated by gas chromatography as the technique provides the best resolution. Therefore this method will be implemented for improving results substantiation.

**Background**

Student in Biotechnology, Chemical and Biochemical Engineering or Chemistry students with interest in science application

**Motivation**

Obtaining an insight into the variety of biological processes and the development of industrial bioprocesses by applicable quantification and optimization.

**Deadlines**

The renumerated Master project can start from February 2013 and will last a minimum of 6 months.