

## Title:

Trace Elements and Chelate complexes in anaerobic digestion

## Introduction and goal:

One of the aim of the BioRist project is to develop an innovative process for biogas production from rice straw and to investigate the dynamic of the developed process. Methanogenic bacteria are playing an essential role in the biogas process and these bacteria require special nutrients for their metabolism and growth. The important trace elements for the growth of methanogens are iron, nickel, cobalt, boron, and selenium. The enzymes and coenzymes which are needed for metabolism are not formed properly if the trace elements are not available in sufficient concentrations and it leads to decrease the performance of methanogenic microorganisms.

The availability of the trace elements depend not only from the total element concentration but also from their bioavailability. For example complexing agents can improve the bioavailability by keeping the ions in the soluble fraction.

This study aims to determine:

1. the theoretical optimal concentrations of trace elements for the BioRist Biogas process by a literature review and an inquiry at the companies
2. the functions and effects of chelate complexes
3. Methods to determine the chelate complexes in biogas digesters.
4. The relationship between the concentration of trace elements and chelate complexes.

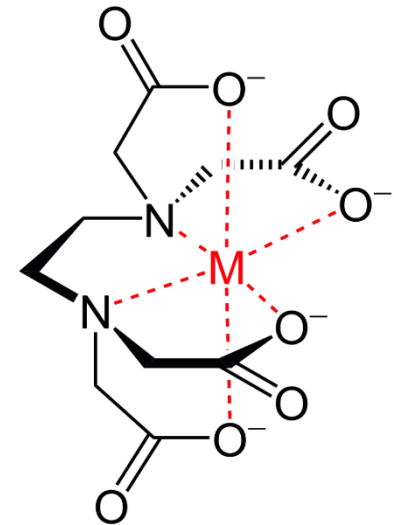


Figure 1: EDTA metal ion chelate complex

## Schedule:

- March-April: Literature research
- May: preparation of questionnaire and inquiry
- June-August: data evaluation and writing of the thesis

**In case you are interested in this topic or you have questions please do not hesitate to write us an email.**