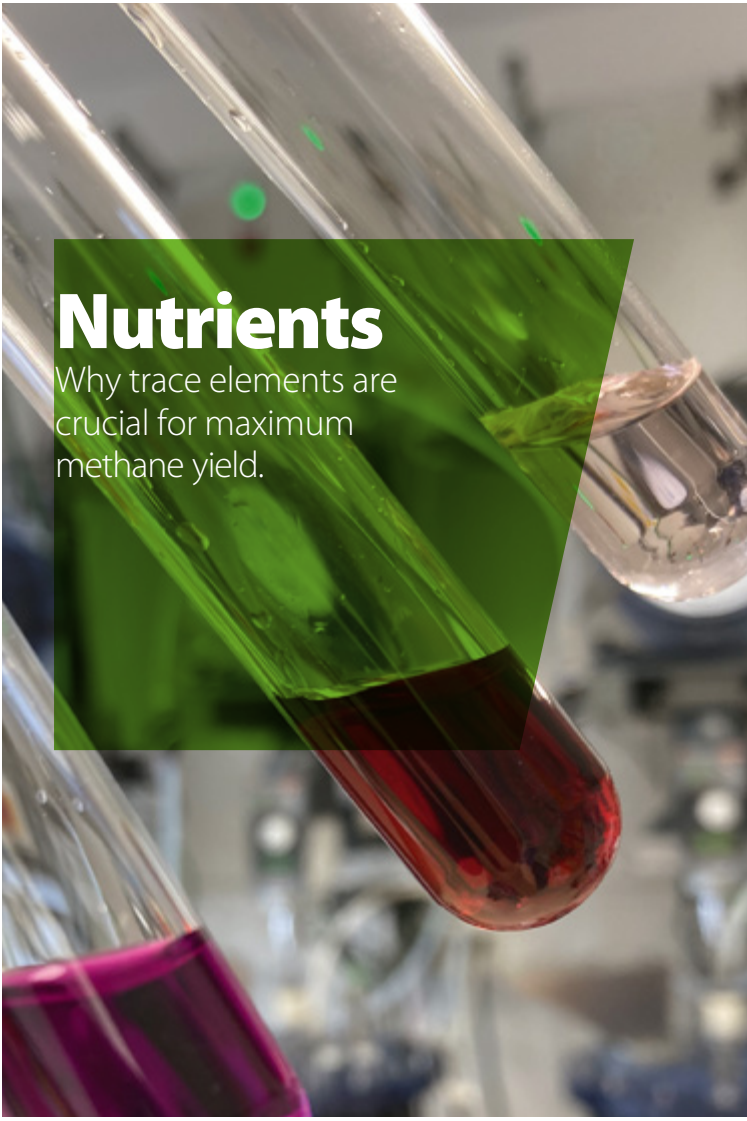


Nutrients

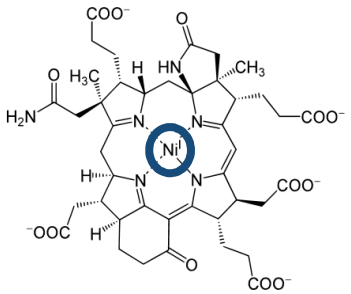
Why trace elements are crucial for maximum methane yield.

The perfect nutrient supply is a team effort. If one element is missing, the entire microbiological process is impaired. As a result, the efficiency of the biogas plant decreases and methane production suffers. Bacteria produce enzymes for their own metabolism and growth. In many of these enzymes, trace elements are part of the active center or important cofactors. These enzymes depend on trace elements in order to function at all. For a consistently high methane yield and smooth operation, it is therefore im-portant to close nutrient deficiencies quickly and efficiently. By using our Z-5 complex products, which contain high-quality trace elements such as iron, cobalt, selenium, manganese, molybdenum and nickel, you can ensure that your biogas plant runs flawlessly and achieves a maximum energy yield.

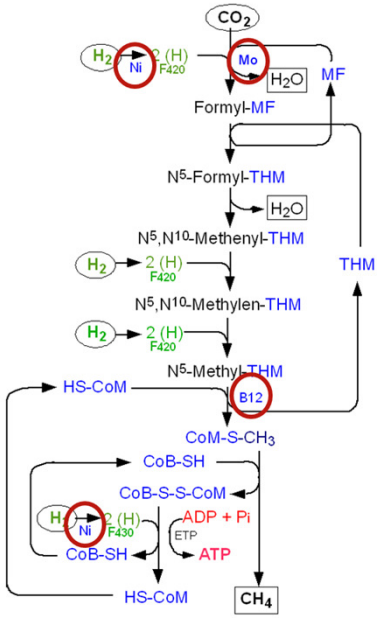
- Biogas process is stabilized immediately
- Methane yield rises quickly after fixing the deficiency
- Increases breakdown of fatty acids and growth of biocenosis
- High product safety: pH-neutral, non-corrosive, non-toxic or carcinogenic
- Manual addition or automatic dosing with pump possible

TRACE ELEMENTS

- **Why are trace elements important?**
  - Bacteria produce enzymes for their own metabolism and growth
  - Trace elements are cofactors of many enzymes or a part of their active site
  - These enzymes do not work
    without trace elements



F430 =cofactor of methyl-coenzyme-M-reductase



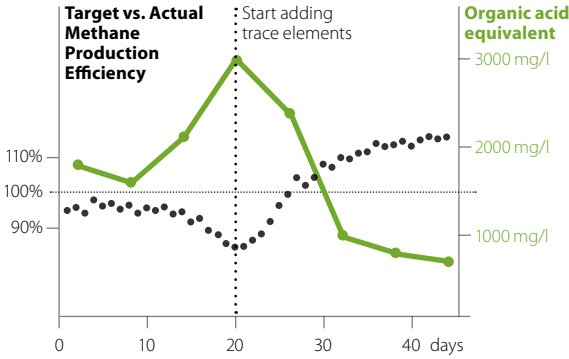
TRACE ELEMENTS IN BIOGAS PROCESS

Which trace elements do we need…

Element	Symbol	Function
Cobalt	Co	Central atom of Vitamin B12 Methanogenesis: Transfer of methyl-groups Acetogenesis: important for building of Acetyl-CoA
Manganese	Mn	electron acceptor/electron donor of many microorganism
Molybdenum	Mo	Methanogenesis: Cofactor of central enzymes (FDH;FMDH); catalyze the oxidation and reduction reactions of CO_2
Nickel	Ni	Central atom of many enzymes e.g. hydrogenase, cofactor F430 (methanogenesis)
Selenium	Se	Amino acids: selenocystine or selenomethionine; Methanogenic archeae need this amino acids for oxidation of hydrogen
Iron	Fe	electron acceptor/electron donor of methanogenesis In many other enzymes (Fe-Hydrogenase, Ferrodoxin etc.) Important for the reduction of sulfide → Preventation of sulfide toxicity

Trace elements are very important for methanogenesis!!!

Maximum performance



Complex Z-5

- Concentrated mixture with high Co + Ni content
- Normal dosage 1.0 L/day per 1 MW el. capacity
- Suitable for automatic dosing