Foto: IGAS research, Goslar

APPLICATION OF CHALK

for municipal & industrial wastewater treatment

- Increase of acid capacity and stabilisation of pH
- Improvement of nitrification and assurance of ammonia degradation
- Formation of stable flocs and reduction of turbidity
- Sludge weighting and improvement of sludge drainability
- Simple dosage and more occupational safety

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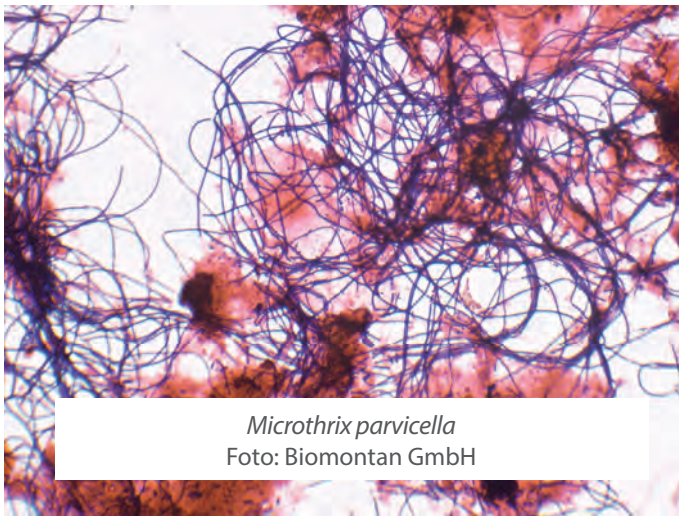
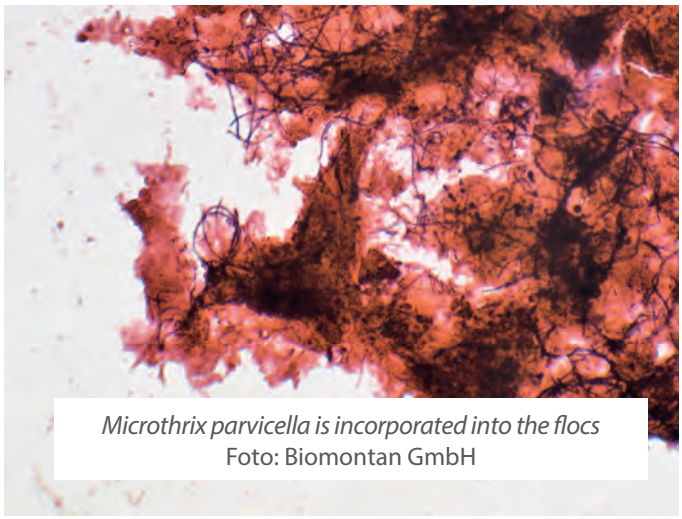
REDUCTION OF FILAMENTOUS-NESS

- **Filamentous bacteria** are increasingly incorporated into the **compact flocs.**
- As a result, the filamentous bacteria loose their negative effect on **settling behaviour,** but retain their good **degradation performance.**



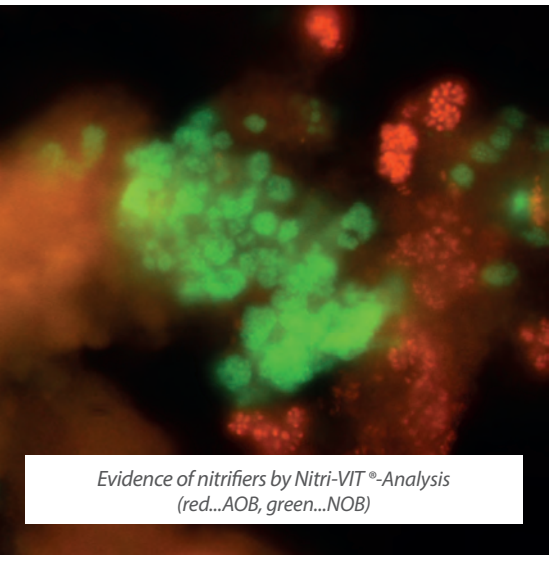
Microthrix parvicella
Foto: Biomontan GmbH



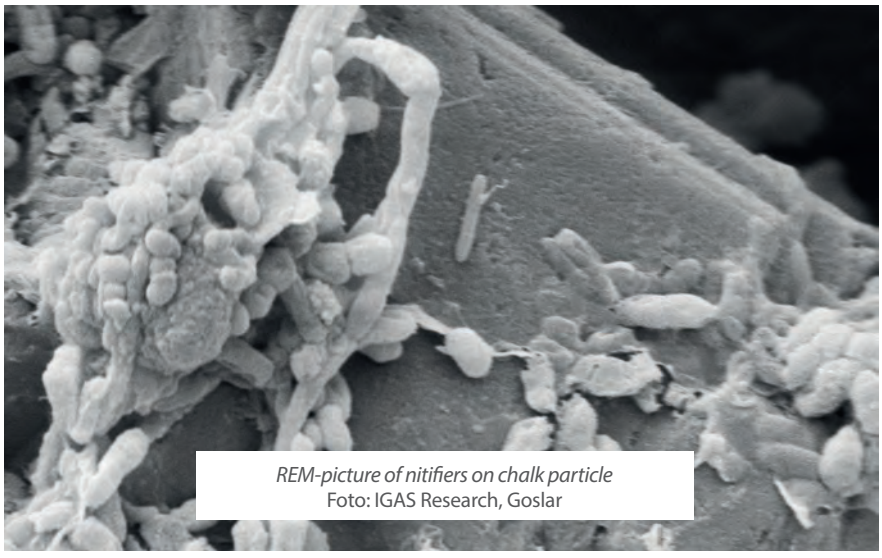
Microthrix parvicella is incorporated into the flocs
Foto: Biomontan GmbH

IMPROVEMENT OF NITRIFICATION

- Chalk particles within the flocs **stabilise** the **pH value**
- **Nitrifying bacteria intensively attach** to the chalk particles within the flocs (they prefer a stable pH value).
- The close **association** of ammonium-oxidizing bacteria (AOB) and nitrite-oxidizing bacteria (NOB) has a positive effect on nitrification.



Evidence of nitrifiers by Nitri-VIT ®-Analysis (red...AOB, green...NOB)



REM-picture of nitifiers on chalk particle
Foto: IGAS Research, Goslar

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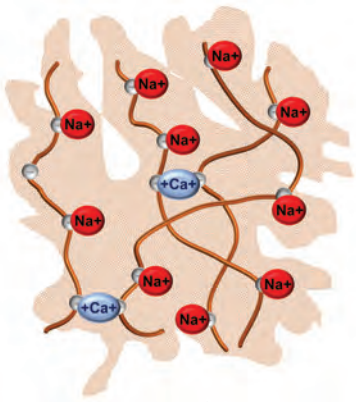
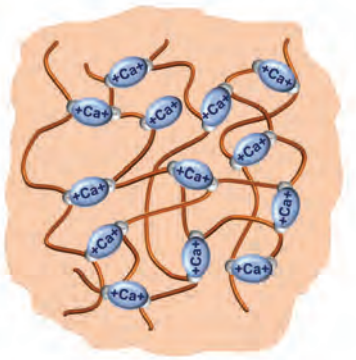
STABILISATION OF THE FLOCKS

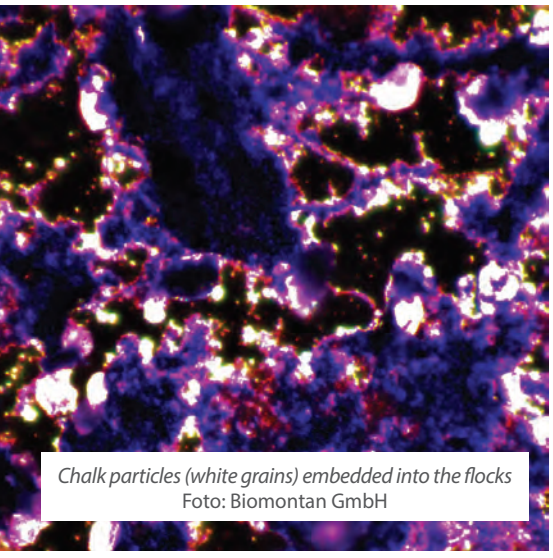
- Chalk provides the **calcium important for flocculation.** Due the **incorporation of chalk particles into the flocs** the calcium is directly available to the floc-forming bacteria.
- In combination with iron, chalk forms a **stable floc framework**, that improves the strenght of the flocs.
- With chalk application a **measurable increase of Ca-content** in the flocs can be established.



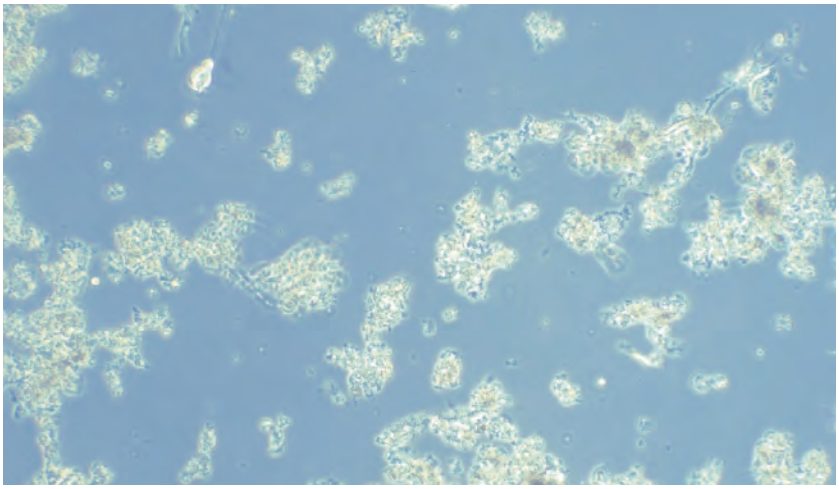
Unstable flocs:
Na-Ions are blocking the binding points of the EPS

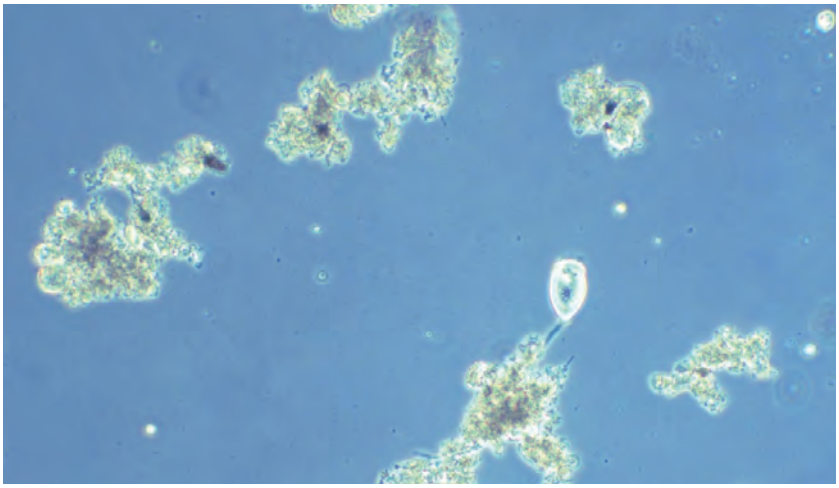


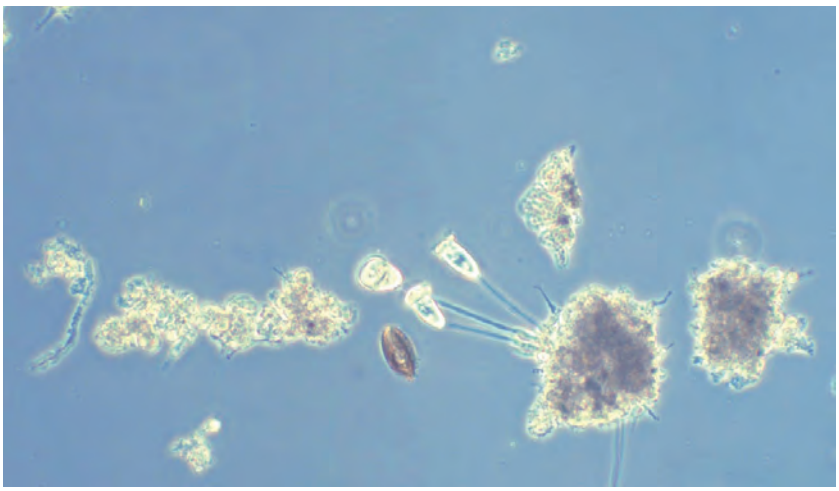
Stable floc formation:
Cross-linking of EPS by Ca-Ions



Chalk particles (white grains) embedded into the flocks
Foto: Biomontan GmbH







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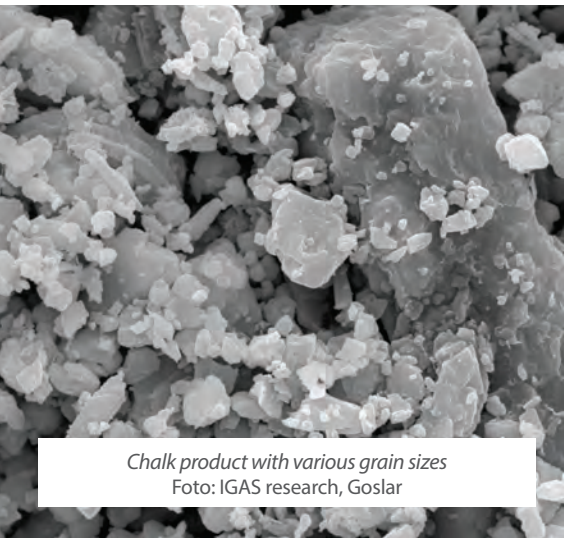
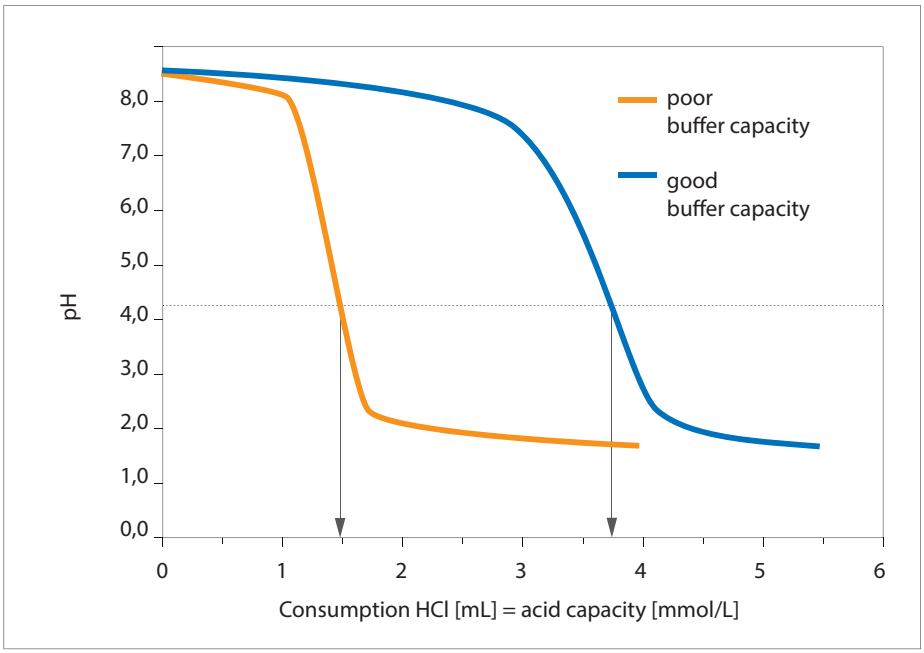
INCREASE OF ACID CAPACITY

- The acid activity rises with the Ca-content in the activated sludge and so does the stability against to pH changes.
- In activated sludge, nitrification produces acid which reduces the pH value. At a low acid capacity the pH can drop significantly and damage the microorganisms.



Chalk product with various grain sizes
Foto: IGAS research, Goslar



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FEATURES & FIELDS OF APPLICATION

WHY CHALK?

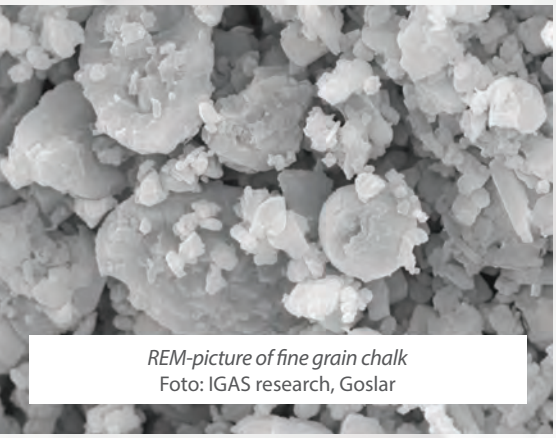
- Improvement of flocculation
- Stabilisation of nitrification
- Weighting of activated sludge
- Improvement of sludge dewatering
- Reduction of polymer demand
- Reduction of MAP-deposits

FEATURES

- natural calcium carbonate (chalk), all-natural product
- rich in microstructures
- large growing surface for nitrifiers
- various product types for various applications

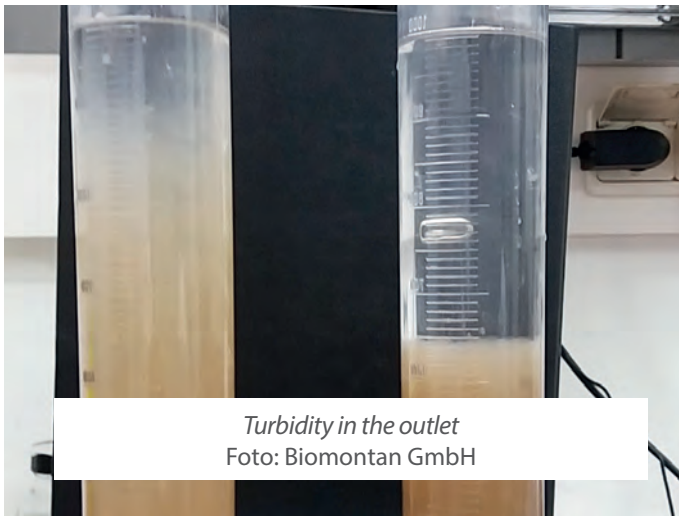
RECOMMENDED FOR PLANTS WITH:

- Poor settling properties
- Floc break-ups or insufficient flocculation
- Distorted nitrification
- Turbidity in the outlet
- Low acid capacity
- Low Ca/Na-ratio due to industrial wastewater
- Disbalanced Ca/Na-ratio (municipal wastewater treatment plants especially during winter)



REM-picture of fine grain chalk
Foto: IGAS research, Goslar

Floating sludge
Foto: Biomontan GmbH



Turbidity in the outlet
Foto: Biomontan GmbH

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DOSAGE

SIMPLE DOSAGE

- dry dosing as powder
- directly into the activated sludge or the return sludge
- intermittent dosing possible (eg once daily, twice a week etc.)
- no harm from overdosing
- no clumping
- not classified as dangerous good, neutral pH

Dosage from BigBag
Foto: Biomontan GmbH

Dosage from storage silo
Foto: Biomontan GmbH

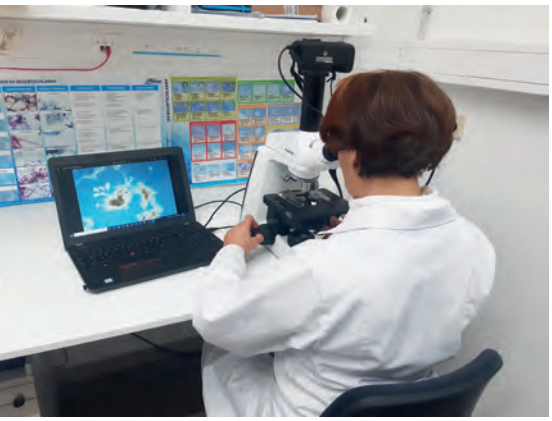
APPLICATION SUPPORT & MONITORING

BEFORE DECIDING ON A CHALK APPLICATION

- Extensive **system analyses** of the plant
- **Water analysis**
- **Microscopical examination** of activated sluge
- Selection of the **optimal chalk product** for your application
- Recommendation of the **dosing quantity** and **dosing point**
- Dosing system for operational test

DURING THE CHALK APPLICATION

- Supervision by our application specialists
- **Regular analyses** of water and activated sluge
- Adjustment of chalk dosage, if necessary
- Special analyses possible:
  - Gen probe analyses and nitrifiers
  - Activity tests
  - Nitrification performance



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