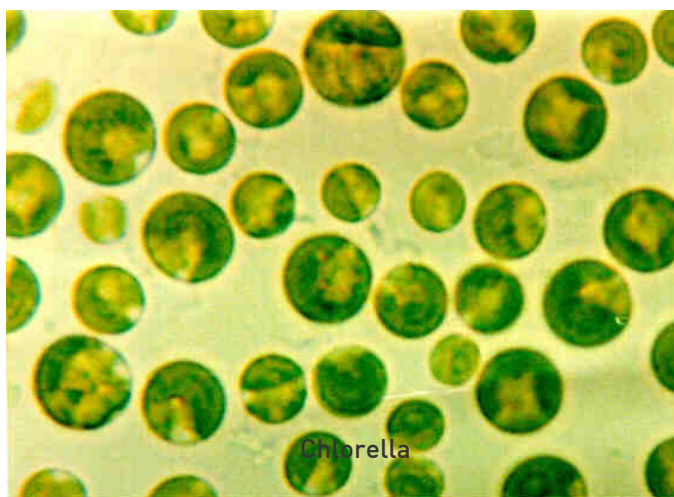


## C03 - Influencing algae reproduction conditions by ionic additives

### Introduction

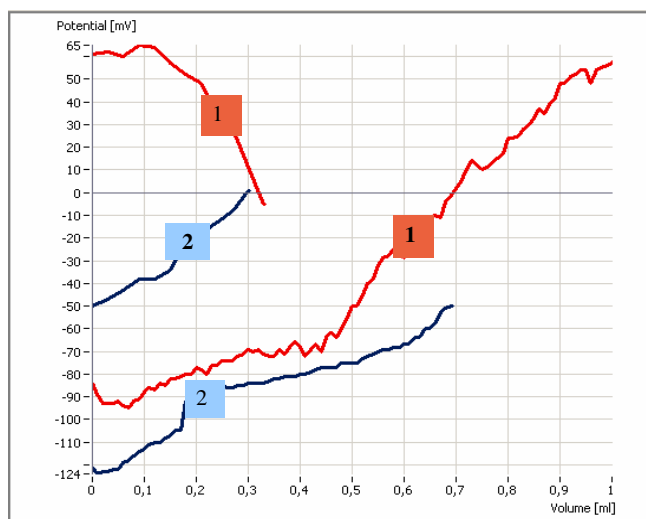
Ionic additives in algae cell suspensions are a useful tool to control the density, compactness and agglomeration of the suspended cells. These parameters affect the reproduction rate of the algae considerably. The additives are polymers AND fine particles. **Stabino®** provides a useful tool for screening work in such suspensions.



### Monitoring the algae's ionic charge with the Stabino® potential [mV]

Depending on the objective of the experiment, the ionic surface charge of the algae is adjusted accordingly.

During the automatic titration of the additives up to a certain point, the **Stabino®** monitors the cell's interface potential. This correlates directly to the ionic strength of the interface charges and hence, to the repulsion force between the cells.



1a-Red: Titration with cationic polymer solution, followed by  
1b-Red: titration with anionic particle suspension

2a-Blue: Titration with cationic polymer solution, followed by  
2b-Blue: titration with cationic particle suspension



individual particle processing  
size - concentration - zeta potential  
> 70 nm size distribution  
10<sup>6</sup> to 10<sup>10</sup> particles/mL concentration  
zeta potential stability parameter  
patented image sharpness stability

Particle Metrix.  
share our view

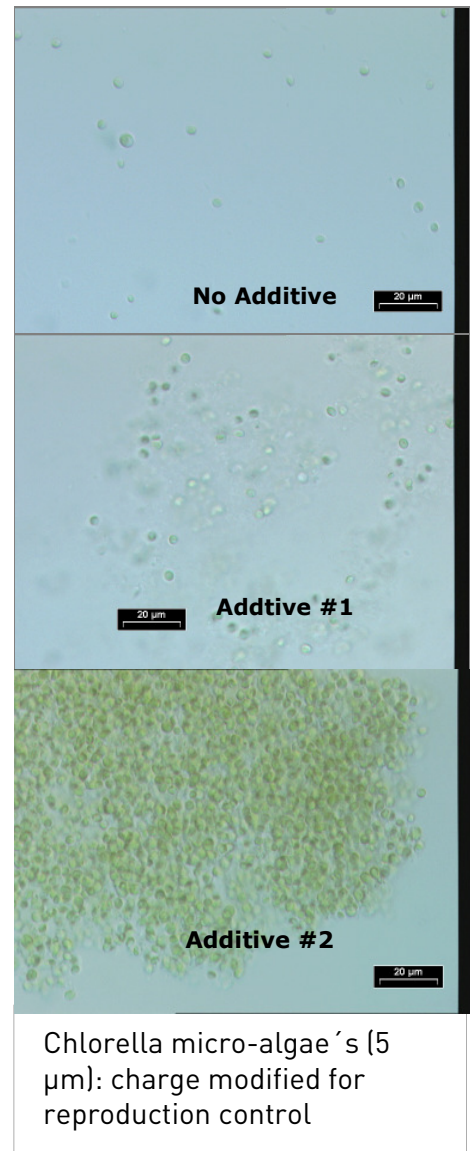
## The Measurement

Only 10 ml of sample at concentrations between 0.001 and 10% in volume are needed. The sample in a cylindrical teflon® container, is moved up- and downwards by an oscillating piston. A streaming potential SP is induced and detected between the two electrodes. The SP reflects the ionic strength at the particles interface.

The SP principle works for particle sizes between 1 nm to 100 µm within a viscosity range of 0.4 to 50 mPa.s. Due to the fact, that Streaming Potential is based on an electrical measurement, it is insensitive to bubbles, color and absorption. Apart from the concentrations of the reaction partners, no other sample parameters are required. No sample circulation is needed during titration. The mixing of the titrand into the sample is achieved by the piston movement making the titration very efficient.

## Result

The result of two ionic treatments of 5 µm size micro-algae is shown here:



## Conclusion

Compared to other methods, the simplicity and titration performance of the **Stabino®** is outstanding.

Volumetric titrations are finished within a few minutes. In addition, if pH plays a role, pH-charge titrations can be done easily.

The **Stabino®** as well as serving as a powerful screening tool, also provides valuable information regarding the interaction of particles with their surrounding liquid. Very often, the potential measurement alone at one moment in time does not give the full picture of the electrostatic behavior of a dispersion.