

High effective harvesting of microalgae *Chlorella prothotecoides* via flocculation with cationic starch

Letelier-Gordo, Carlos Octavio; Karakashev, Dimitar Borisov; Holdt, Susan Løvstad; Angelidaki, Irimi

Publication date:
2013

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Letelier Gordo, C. O., Karakashev, D. B., Holdt, S. L., & Angelidaki, I. (2013). High effective harvesting of microalgae *Chlorella prothotecoides* via flocculation with cationic starch. Poster session presented at International Conference on Algal Biorefinery, Kharagpur, India.

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

High effective harvesting of microalgae *Chlorella protothecoides* via flocculation with cationic starch

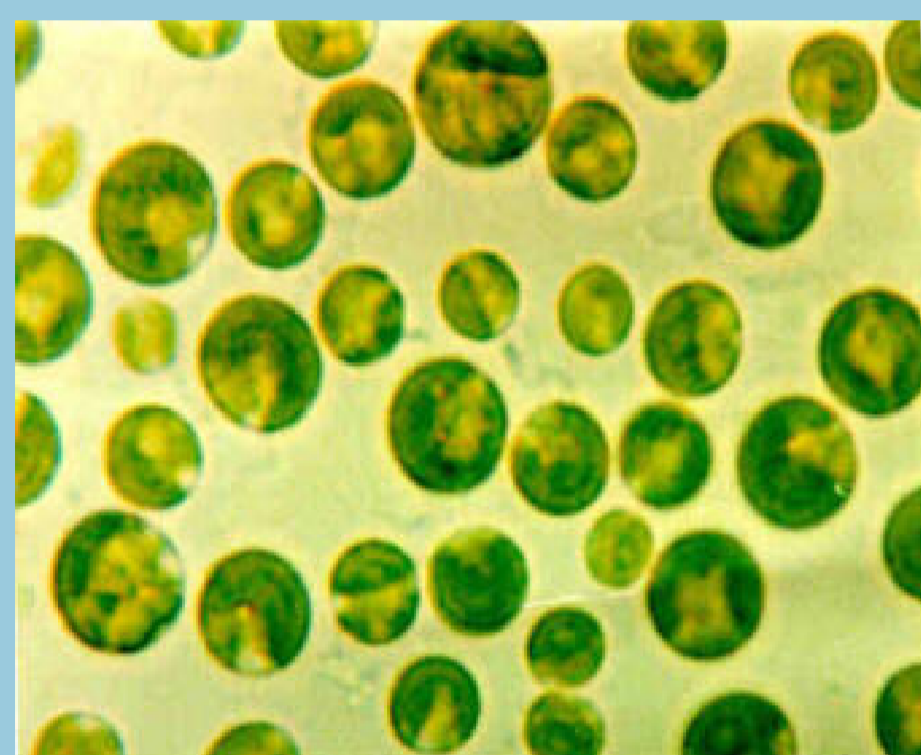
Carlos Octavio Letelier Gordo, Dimitar Karakashev*, Susan Løvstad Holdt, Irimi Angelidaki
*Corresponding author: dbka@env.dtu.dk

Introduction

Microalgal harvesting step accounts up to 30 % of the total cost of biomass production.

The aim of the study was to investigate the effect of an organic polymeric flocculant, Greenfloc 120, to flocculate microalgal species *Chlorella protothecoides*. Effect of pH on the flocculation process under optimal flocculant level was also investigated.

Materials and Methods



Flocculation efficiency (FE) was calculated as:

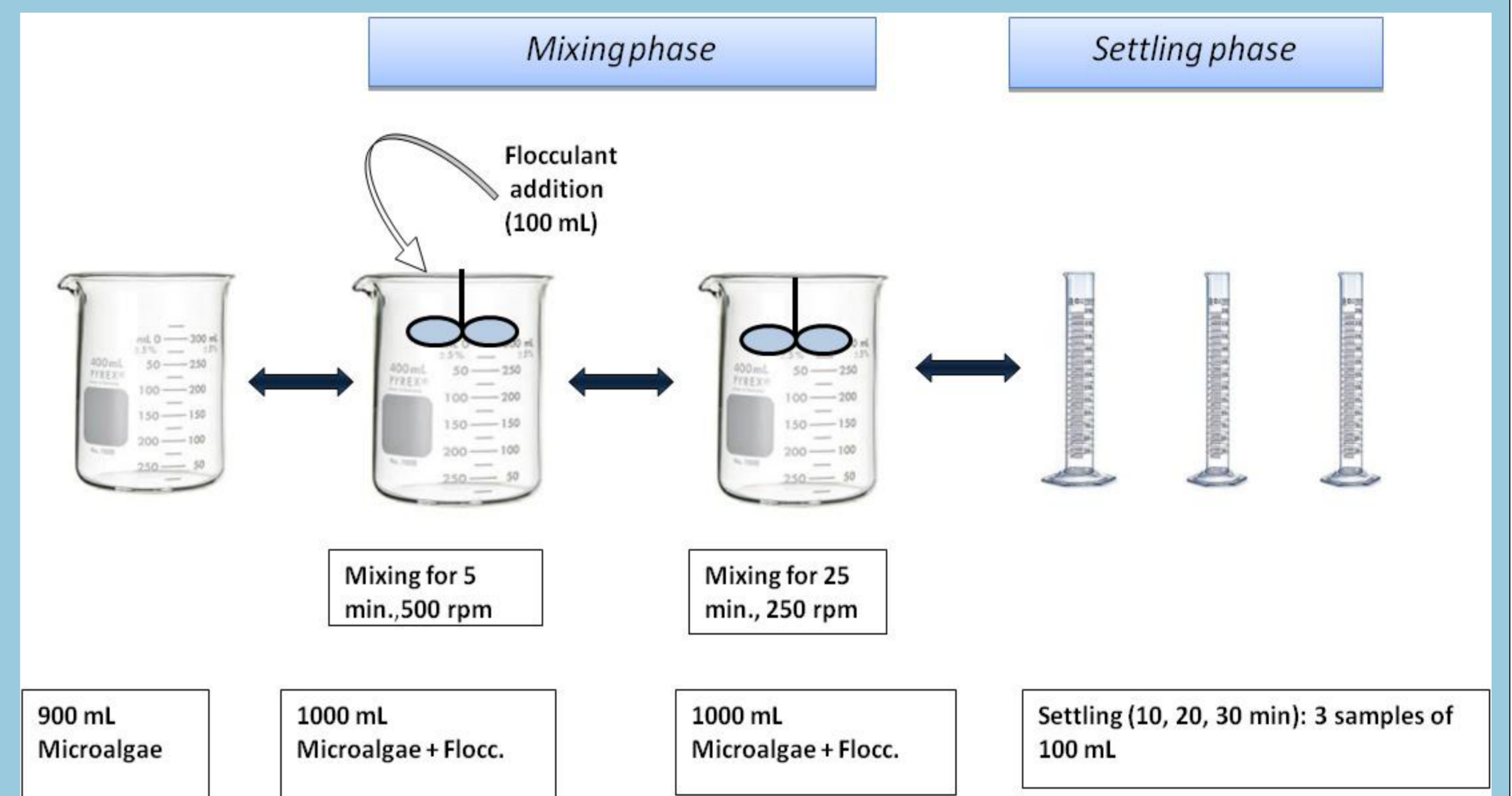
$$FE (\%) = \frac{OD_{550}(t_0) - OD_{550}(t)}{OD_{550}(t_0)} * 100$$

where:

OD₅₅₀ (t₀): OD₅₅₀ before flocculant addition

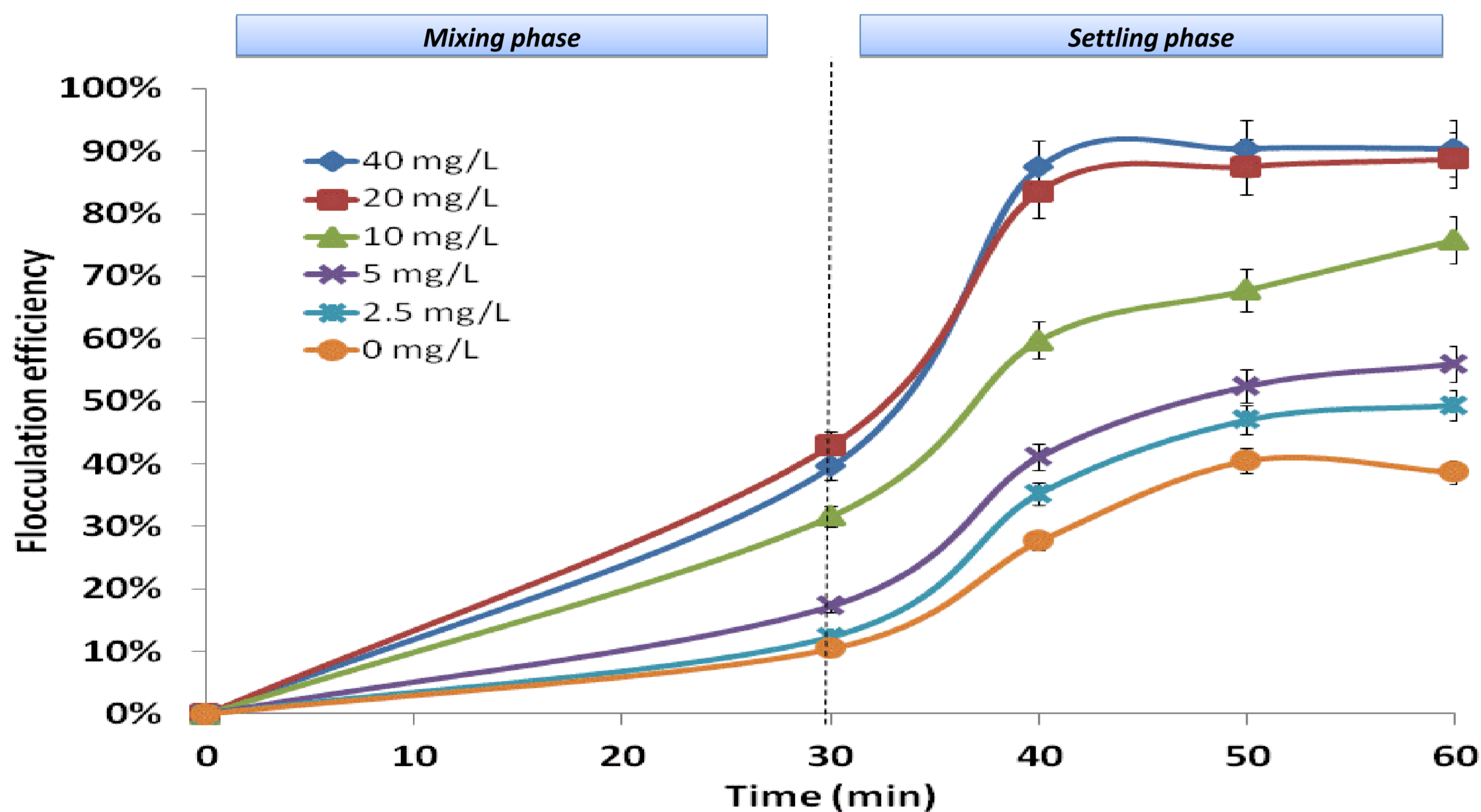
OD₅₅₀ (t): OD₅₅₀ after flocculant addition

Experimental setup



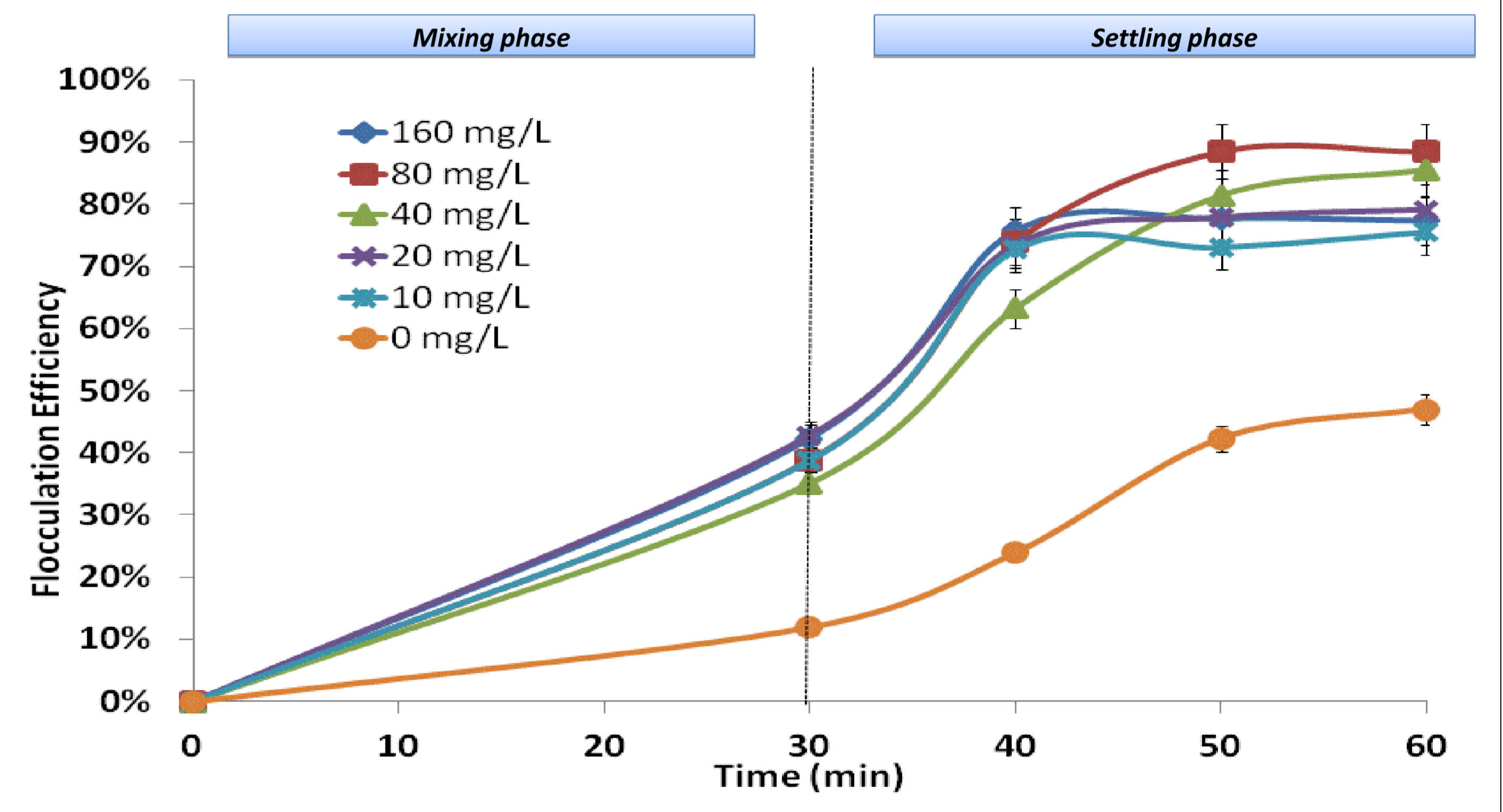
Results

Dynamics of flocculation efficiency (FE): biomass 0.44-0.72 g/L



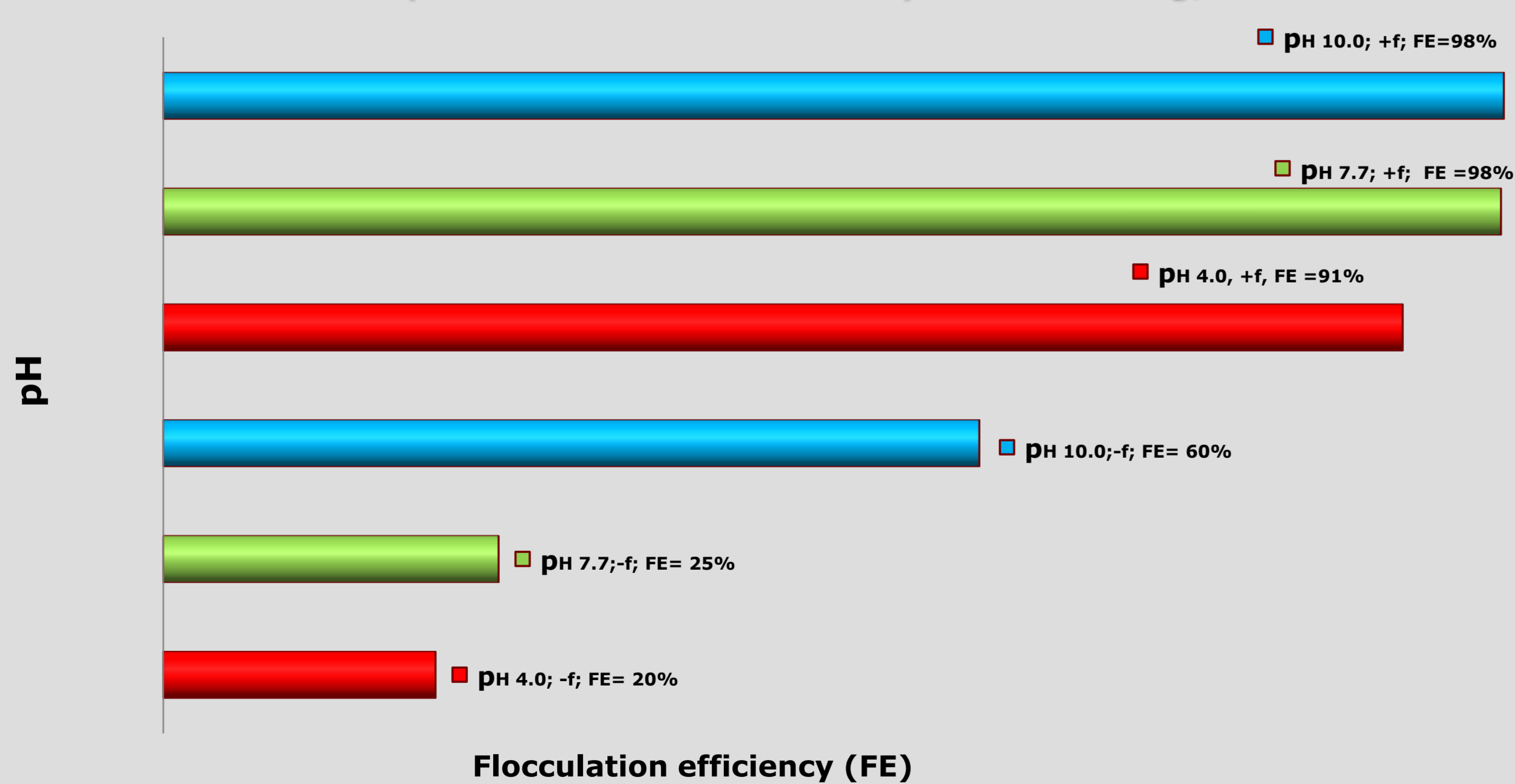
Results

Dynamics of flocculation efficiency (FE): biomass 0.78 g/L



Results

Effect of pH on flocculation efficiency: biomass 1.1 g/L



Conclusions

This study demonstrated Greenfloc 120 as a promising agent for flocculation of *Chlorella protothecoides* at neutral and high pH.

It can be concluded that:

- **40 mg flocculant/L:** optimal level (FE > 80 %) for biomass concentrations 0.44-0.72 g/L
- **80 mg flocculant/L:** optimal level (FE > 80 %) for biomass concentration 0.78 g/L

The best results were obtained at:

- **pH 10** (FE=60-73 %) in **absence of flocculant**
- **pH 7.7 and pH 10** (FE=91-98 %) in **presence of flocculant** (40 mg/L)

Acknowledgments

This work was supported by Danish Research Council for Strategic Research (Jr. nr. 09-067601).

