

# Supplementary Materials

## Hydrophobisation of silica nanoparticles using lauroyl ethyl arginate and chitosan mixtures to induce the foaming process

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2. Figure S2: Surface tension variation in chitosan 100 ppm–LEA 100 ppm—acetic acid 1%wt. mixture;
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5. Figure S5: The foam from chitosan/acetic acid mixture with the Levasil® 100/45% (30 nm) nanoparticles;
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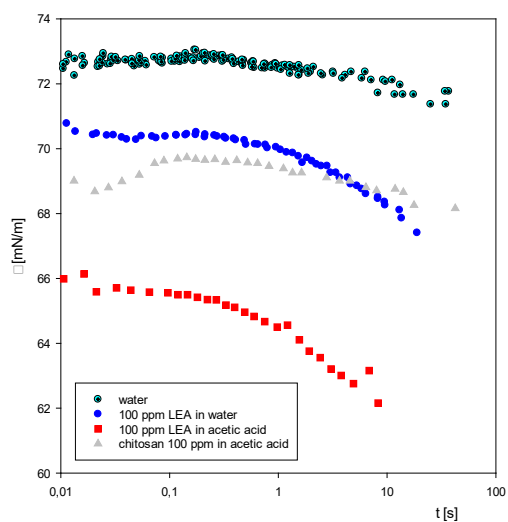


Figure S1 The dynamic surface tension of chitosan and lauroyl ethyl arginate in water and in the presence of 1%wt. chitosan.

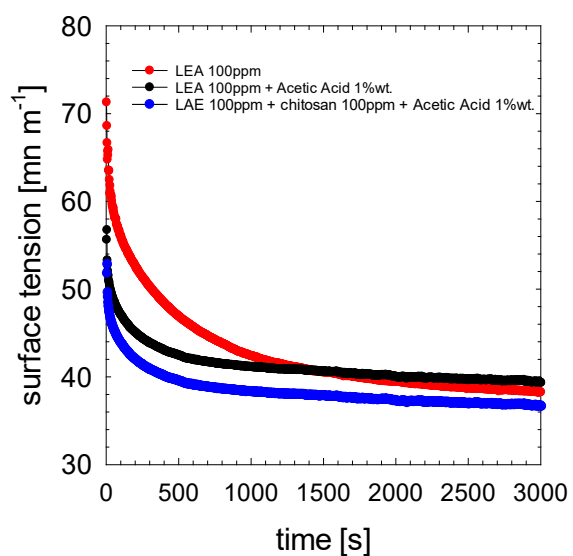


Figure S2. Surface tension variation in chitosan 100 ppm– LEA 100ppm - acetic acid 1%wt. mixture.

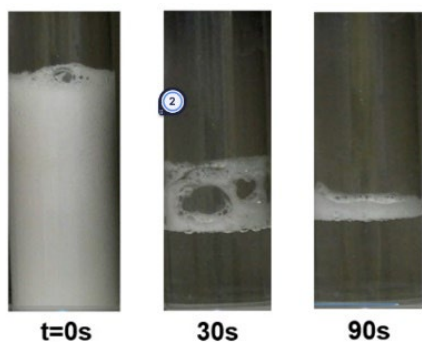


Figure S3 The foam evolution in the LAE 100ppm in the presence of 1%wt. acetic acid.

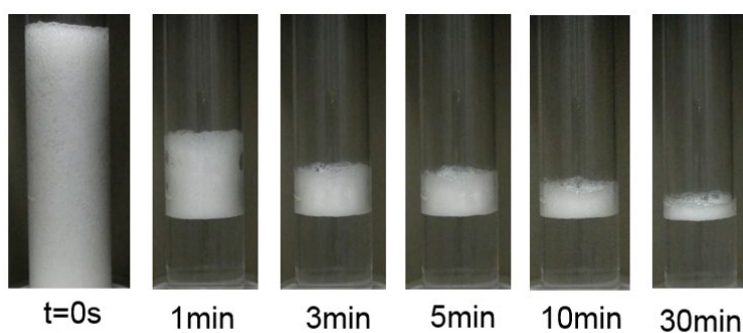


Figure S4 Foaming properties in the mixture of chitosan 100ppm, LEA 100ppm and acetic acid 1%wt.

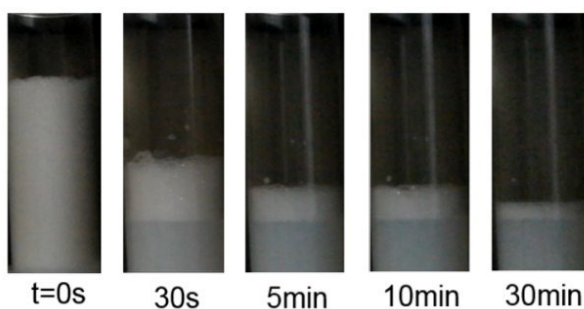


Figure S5 The foam from chitosan/acetic acid mixture with the Levasil® 100/45% (30nm) nanoparticles.

### Levasil 30nm 100ppm

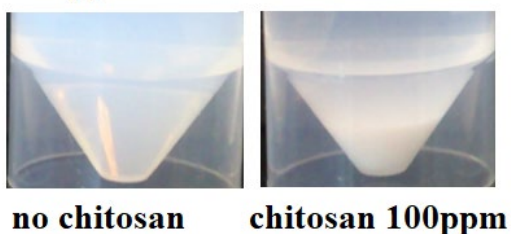


Figure S6 Sedimentation of the precipitated particles of Levasil® 100/45% in the presence of chitosan 100ppm

Table S1. The zeta potential change of silica particles under the influence of acetic acid, chitosan and lauroyl ethyl arginate LAE.

Levasil® Silica	Water	Acetic acid 1%wt.	Chitosan / Acetic Acid 1%wt.	LAE in water	LAE / Acetic Acid 1%wt.	LAE / Chitosan / Acetic Acid 1%wt.
30 nm	-54mV	-17mV	39mV	-54mV	-14mV	39mV
9nm	-50mV	-22mV	52mV	-52mV	-29mV	56mV
6nm	-57mV	-19mV	-19mV	-58mV	-29mV	-11mV

Table S2. Bulk viscosities of silica particles under the influence of acetic acid, chitosan and lauroyl ethyl arginate LAE.

Levasil® Silica nanoparticles	Water  (cSt)	Acetic acid 1%wt.  (cSt)	Chitosan / Acetic Acid 1%wt.  (cSt)	LAE / Chitosan / Acetic Acid 1%wt.  (cSt)
30 nm	0.99	1.03	1.18	1.17
9nm	0.98	1.02	1.30	1.22
6nm	1.01	1.04	1.30	1.22