32nd Conference of
The European Colloid and Interface Society
Ljubljana, Slovenia, 2nd - 7th September 2018

Book of Abstracts

Book of Abstracts of The 32ⁿᵈ Conference of the European Colloid and Interface Society - ECIS2018

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Preface

Welcome to the 32nd Conference of the European Colloid and Interface Society (ECIS2018) in Ljubljana. This conference is putting Slovenia on the list of countries which have hosted this event since the first in 1987 in Como, Italy. With participating scientists from 47 countries, ECIS2018 has become a global event.

The conference was organized jointly by the University of Ljubljana (Faculty of Chemistry and Chemical Technology, Faculty of Pharmacy, Biotechnical Faculty, Faculty of Mathematics and Physics), National Institute of Chemistry, Jožef Stefan Institute and the Slovene Chemical Society. We hope that this conference will meet your expectations and serve, as previous ones have, to exchange ideas and findings, to promote contacts and networks and to strengthen old and establish new collaborations in the rapid growing field of colloid and interface research.

The topics cover fundamental and applied advances in interfaces, dispersed systems, wetting, complex fluids, micro- and nano-materials, nanoparticles, specific-ion effects, self-assembly of surfactants, polymers and proteins and advances in theory and instrumentation. Besides the 12 topics of the ECIS2018 conference, which will be organized in a traditional way, there will also be an additional Satellite Session entitled *Modern Engineering of Colloids and Interfaces*, hosting a selected group of invited speakers. Last year, the international colloid and interface community lost six prominent representatives of extreme professional authority: Hans Lyklema, Dotchi Exerowa, Dimo Platikanov, Kåre Larsson, Helmuth Möhwald and Ivan B. Ivanov. At ECIS2018 the European Colloid and Interface Society will honour them at the Memorial Session.

The scientific programme of the conference consists of 6 plenary lectures. Amongst these, one will be given by the Solvay prize winner and one by Overbeek medal winner. Furthermore, we have 37 keynote lectures, 13 invited and 24 selected by the International Scientific Committee, who has also selected 177 oral presentations from more than 400 submitted abstracts for oral presentations. Across three poster sessions, 375 posters will be presented. The participants have the possibility to submit manuscripts and reports about their oral and poster presentations for peer-review and rapid publication in special issues of Colloid and Surfaces A (Elsevier) and Polymers (MDPI).

We thank all the sponsors of the conference for their support.

Finally, we thank you for participating in the conference and for contributing to its scientific content.

<div align="right">The 32nd ECIS Conference Organizing Committee</div>

Casein probe–based fast plasmin determination in the picomolar range by an ultra-high frequency acoustic wave biosensor

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Detection of residual plasmin activity in milk represents a difficult challenge for the dairy industry. Conventional methods are either too expensive or incapable of providing enough data from UHT treated milk. Acoustic wave–based biosensors operated in the thickness shear mode (TSM) showed potential for the detection of proteolysis of β-casein, a milk protein, by protease plasmin. An ultra-high frequency device, the electromagnetic piezoelectric acoustic sensor (EMPAS), designed to enhance the sensitivity of TSM, was tested for detection of plasmin at low concentration. β-casein layers immobilised on the hydrophilic or hydrophobized surfaces of EMPAS quartz discs were used as substrate for the enzyme. On both surface types, the adsorbed β-casein mass and the stability of the layer was compared, with the result that hydrophobic surfaces provide superior conditions for immobilisation than the hydrophilic case. Consequent proteolysis measurements of these substrate layers were carried out in a broad plasmin concentration range (32 pM – 10 nM) in flow mode. Initial reaction rates measured at different enzyme concentrations have been used to construct a calibration curve based on an inverse Michaelis–Menten type equation. The sensitivity of the EMPAS allowed measurements of as low as 32 pM concentration of plasmin, reaching (and often exceeding) levels comparable to state of the art techniques like ELISA. The presented method however, unlike ELISA, is effective on a timescale of minute.
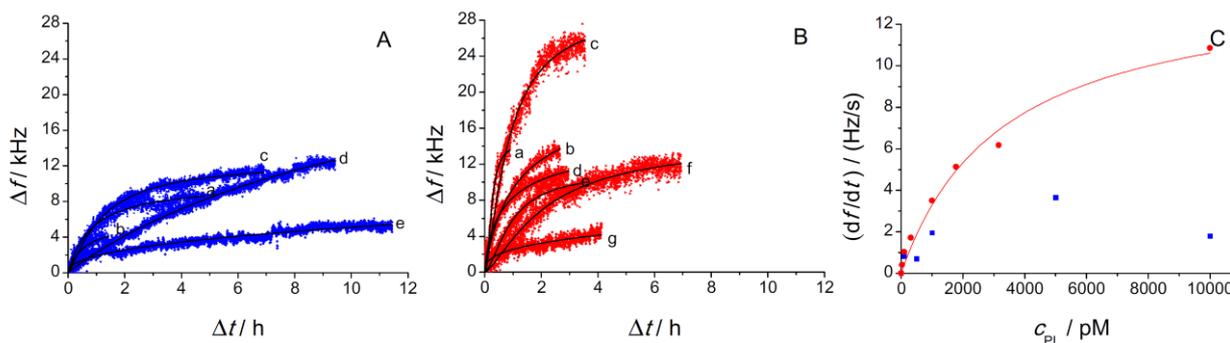
Figure 1. A and B: Time course curves of plasmin activity on β-casein at different plasmin concentrations, plotted on identical scales (measurement points and fitted Hill curves). A) hydrophilic, native quartz crystal: a) 10 nM; b) 5 nM; c) 1 nM; d) 500 pM; e) 100 pM; B) hydrophobic, silanized quartz crystal: a) 10 nM; b) 3.16 nM; c) 1.78 nM; d) 1 nM; e) 316 pM; f) 100 pM; g) 31.6 pM. C: Rates of df/dt initial frequency change determined at different c_{PL} plasmin concentrations for hydrophilic (■) and hydrophobic (●) quartz crystal surfaces, respectively.

[1] M. Thompson, S.M. Ballantyne, L.E. Cheran, A.C. Stevenson and C.R. Lowe, *Analyst*, 2003, **128**, 1048.
[2] S.M. Ballantyne and M. Thompson, *Analyst*, 2004, **129**, 219.