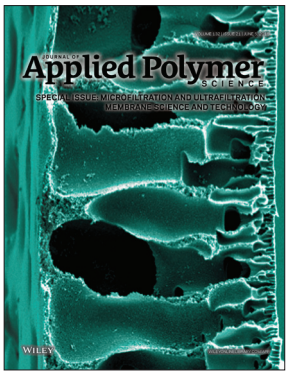
JOURNAL OF Applied Polymer SCIENCE

Special Issue: Microfiltration and Ultrafiltration Membrane Science and Technology

Guest Editors: Prof. Isabel C. Escobar (University of Toledo) and Prof. Bart Van der Bruggen (University of Leuven)



EDITORIAL

Microfiltration and Ultrafiltration Membrane Science and Technology
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REVIEWS

Nanoporous membranes generated from self-assembled block polymer precursors: *Quo Vadis*?
Y. Zhang, J. L. Sargent, B. W. Boudouris and W. A. Phillip, *J. Appl. Polym. Sci.* 2015, **DOI: 10.1002/app.41683**

Making polymeric membranes anti-fouling via "grafting from" polymerization of zwitterions
Q. Li, J. Imbrogno, G. Belfort and X.-L. Wang, *J. Appl. Polym. Sci.* 2015, **DOI: 10.1002/app.41781**

Fouling control on MF/ UF membranes: Effect of morphology, hydrophilicity and charge
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Preparation of a poly(phthalazine ether sulfone ketone) membrane with propanedioic acid as an additive and the prediction of its structure
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Preparation and characterization of MOF-PES ultrafiltration membranes
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LOW-FOULING POLYMERS

Low fouling polysulfone ultrafiltration membrane via click chemistry
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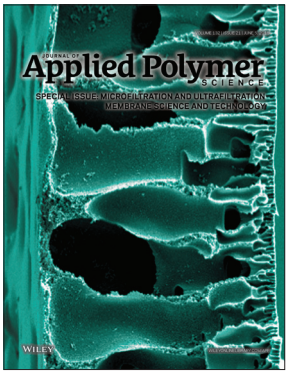

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K. Yokwana, N. Gumbi, F. Adams, S. Mhlanga, E. Nxumalo and B. Mamba, *J. Appl. Polym. Sci.* 2015, **DOI: 10.1002/app.41661**

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Modification of microfiltration membranes by hydrogel impregnation for pDNA purification
P. H. Castilho, T. R. Correia, M. T. Pessoa de Amorim, I. C. Escobar, J. A. Queiroz, I. J. Correia and A. M. Morão, *J. Appl. Polym. Sci.* 2015, **DOI: 10.1002/app.41610**

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H. C. S. Chenette and S. M. Husson, *J. Appl. Polym. Sci.* 2015, **DOI: 10.1002/app.41437**

Journal of Applied Polymer Science

EDITORIAL

Microfiltration and Ultrafiltration Membrane Science and Technology

This special issue of the *Journal of Applied Polymer Science* is focused on membrane technology, more specifically on microfiltration and ultrafiltration membranes. There is a clear reason why the journal highlights the synthesis and use of polymeric membranes. Membranes are at the heart of chemical and environmental engineering applications and have become standard tools for a wide range of separations. Membrane technologies are widely used in separation processes, such as water purification, protein separation, metal recovery, and pigment recovery, enabling them to play a pivotal role in major industries. For example, the food and beverage industry, biotechnology, the chemical and pharmaceutical industry, and municipal water treatment. Nevertheless, there seems to be a missing link in the sense that commercially available membranes are made of a very limited range of polymers, and these may not be the optimal ones. Research in applied polymer science is vital to enhance this field; research published in the *Journal of Applied Polymer Science* is at the forefront of the development of new polymeric membranes, and the improvement of the chemistry of the ones we already know. A good example, and probably the most prominent contribution that should be expected of polymer scientists, is the improvement of membrane resistance against fouling. Kumar and Ismail review the underlying mechanisms of the phenomenon in this special issue, which are related to morphology, hydrophilicity and charge. They conclude that the key is in the membrane synthesis itself, with an option of post-synthesis improvement by membrane modification. The most promising approaches can therefore be found in polymer modifications, which intrinsically reduce the effect of fouling by eliminating interactions between foulants and the membranes. Several studies of this type can be found in the issue, ranging from hydroxyl functionalized polyvinylidene difluoride/TiO_2 ultrafiltration membranes to surface grafting of polyethylene glycol derivatives, functionalized doped carbon nanotube/polysulfone membranes and poly(vinyl chloride) and poly(ether sulfone)-*g*-poly(ether glycol) methyl ether methacrylate blend membranes. An interesting concept in this context is the application of click chemistry, which is used here to functionalize polysulfone with 1,2,3-triazole ring substituents containing OH groups. The membranes have a lower susceptibility to fouling, because of the resulting increase in hydrophilicity, while maintaining the desirable characteristic of high rejection. We will emphasise again that the solution to a better membrane performance is to be found in polymer chemistry; therefore it follows that the understanding and development of advanced polymers in view of a new generation of membrane applications is a core topic for this journal.

The 'applied' aspect is to be underlined at this point. Advanced polymers for membrane applications are important in the development stage, but often the implementation is missing. This special issue demonstrates that polymer science can lead to impressive improvements in membrane performance. The papers presented here, and in other issues of the *Journal of Applied Polymer Science*, thus afford an open invitation to further develop polymer science in order to produce new membranes that go on to be available in the market. It will be a pleasure to continue to report on the link between polymers and their use in applications beyond the laboratory scale, and at the same time make room in the laboratories for yet a new generation of polymers for membrane applications of both today and the future.

Isabel C. Escobar
Editorial Board
Journal of Applied Polymer Science
Vice-President of the North American Membrane Society
Professor of Chemical Engineering
The University of Toledo
Toledo, U.S.A.

Bart Van der Bruggen
Editorial Board
Journal of Applied Polymer Science
President of the European Membrane Society
University of Leuven
Leuven, Belgium