MELPRO

membrane and electromembrane processes

NOVEMBER 8–11, 2020
PRAGUE, CZECH REPUBLIC
INTERNATIONAL CONFERENCE

book of abstracts

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BOOK OF ABSTRACTS

On-line International Conference
on Membrane Processes

8-11, November 2020

Prague, Czech
Republic

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www.czemp.cz

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To encourage student participation at the conference and to feature excellent works, the organizers of the MEPRO 2020 conference are pleased to award the best student oral and poster presentations. Student Award ceremony will be the part of the Closing Ceremony.

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PREFACE

Dear colleagues,

You are opening the Book of abstracts of the Membrane and Electromembrane Processes Conference MELPRO 2020 which is organized by the Czech Membrane Platform in collaboration with AMCA.

The current covid-19 pandemic has significantly affected the organization of the conference MELPRO 2020. The original date of April 2020 had to be canceled due to the pandemic and the new date was set for November 2020. At the same time we started to prepare for the potential online conference but we were cautiously optimistic that MELPRO 2020 will be held as planned. However the situation does not allow us to organize in-person conference and MELPRO 2020 will take place online exclusively. You can attend the program via ZOOM application and connect with the speakers.

Main objective of the MELPRO 2020 is to provide space for presentation of new research results inside the academic community; it is also open to the exchange of information between the academic and industrial spheres. The organizing committee made the best effort to fulfill the expectations. Based on this target, the following structure of the MELPRO 2020 conference topics was put together:

New membrane materials

Gas, liquid and vapor separation

Pressure driven membrane processes

Electrochemical membrane processes

Membrane systems in water treatment, biotechnology and biomedical applications

Membrane operations in process engineering

Modelling and simulation in membrane systems

Membrane systems in the mining industry

Membrane systems in space

New trends in membrane applications

Membrane systems for new agriculture

We continue to look forward to meeting again in person at the next conference MELPRO. Until that time please register to join us at our first online conference.

Czech Membrane Platform

CHARGED NANOPOROUS MEMBRANES AS AN ALKALINE-RESISTANT SEPARATOR FOR ELECTROCHEMICAL CO_2 REDUCTION

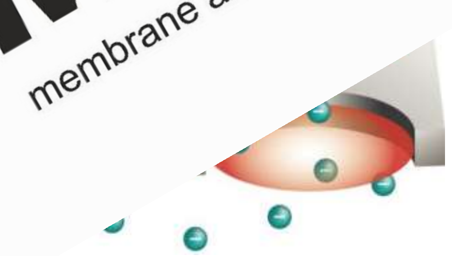
K. V. Petrov[1], D. A. Vermaas[1]

[1] *Department of Chemical Engineering, Delft University of Technology, 2629 HZ Delft, The Netherlands*

Abstract: The electrochemical reduction of CO_2 could allow to use renewable energy from wind and solar directly for the production of sustainable fuels and chemicals. Two of the current issues in CO_2 electrolysis are that the io[illegible] exchange membranes (IEMs) are not stable in the alkaline conditions in whic[illegible] trolytic CO_2 reduction cells often operate, and that these membran[illegible] antial ohmic loss. Therefore, there is a demand for improved IE[illegible] ally stable, highly selective and conductive.

This project aims to tackle these issues usin[illegible]
ultathin nanoporous inorganic IEM (Fig[illegible]
materials can be used as an alt[illegible]
selectivity based on the char[illegible]
between pore size, surfa[illegible]
material is studied u[illegible]

Ultimately, t[illegible]
could m[illegible]
via[illegible]



Fig[illegible] electective ion transport through a positively [illegible] harged nanoporous membrane.

Reference

1. Gosh M., Jorissen K.F.A., Wood J.A. *et al.*, J. Phys. Chem. Lett., 9, 21, 6339-6344, **2018**.

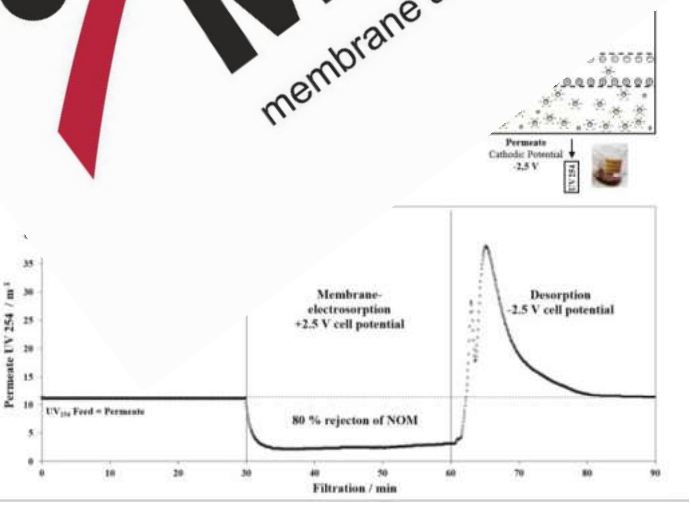
POSITIVELY CHARGED ELECTRICALLY CONDUCTING MEMBRANE: E-SORPTION OF NOM

T. Mantel, M. Ernst

University of Technology Hamburg, Institute for Water Supply and Water resource, Am Schwarzenberg Campus 3, 21073 Hamburg, Germany, (tomi.mantel@tuhh.de)

Abstract: Recent studies showed that electrically conduc ultrafiltration membranes exhibit several advantages regarding fouling and ehavior due to the application of a cathodic electrical potential or surface. A repulsive force is induced when the membrane is to the likewise negative charge of most dissolved or h as natural organic matter (NOM). We used spu ers (15 nm) to generate an electrically c t membrane by coating the active and membrane (pore size ~ 50 nm The novel approach of this anodic cell potential) to th membrane surface. De periodically (e. g potential). The NOM is membr NO

y-



MODELLING ION TRANSFER THROUGH ION EXCHANGE MEMBRANES IN ELECTRODIALYSIS FOR MULTI-IONIC SOLUTIONS

S. Ozkul[1], J. van Daal[1], R. Bisselink[2], N. Kuipers[2], H. Bruning[1], J. Dykstra[1], H.H.M. Rijnaarts[1]

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[2] *Food and Biobased Research, Wageningen University & Research, 6708 WG Wageningen, the Netherlands*

Abstract: Water reuse is one of the solutions to n of freshwater resources. However, continuous use of water ir can result in accumulation of specific ions in the water c bilities for re-use applications. Especially in agricult Na+) in the irrigation water negatively affec crop growth. Developing ion selective fic ions could in many cases increas is a desalination technolo desalination and reuse. E ions. It is an electric place as a result Understanding is important t explain t consid mod r

e
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ed in the model. In
were performed using
of various operational
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l conductivity, temperature and
concentrate and electrolyte) were

LIST OF THE PARTICIPANTS

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CZEMP

The **Czech Membrane Platform (CZEMP)** associates prominent experts and institutions centred on research, development, implementation and application of membrane operations in technological processes of broad spectrum of industry. Hence, the development of the founded Platform is a prerequisite for the interconnection of research and educational subjects with production sphere and other institutions, which are engaged in technologies aiming at a constantly sustainable growth of society.

Basic Mission

- CZEMP interconnects activities of professional community, academic sphere, industrial producers or users of products and technologies in the membrane area
- CZEMP ensures the transfer and stabilization of infobases concerning membrane topics and supports the education in the field
- CZEMP promotes the coordination of activities of subjects acting in the area of research and development of membrane processes, pursuing programmes and both domestic and foreign financial resources
- CZEMP supports and defends common interests of its members with the aim to popularize membrane topics and create a proper atmosphere for their development and stabilization

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