1st Symposium on "Dynamic Covalent Chemistry (DCC) in water"

Sponsored by NWO, Molecules Centre and Polymers Center Twente from MESA+.

Date: October 24th, 2022.
Location: Room Carré 3C (building no.15), Campus University of Twente, Enschede, the Netherlands.

Organizers:
Assist. Prof. Dr. Julieta Paez, Developmental Bioengineering, UT.
Assist. Prof. Dr. Albert Wong, Chemical Reaction Networks, UT.
Dr. Nico Overeem, Molecular Nanofabrication, UT.

Introduction and Aims

Dynamic covalent chemistry (DCC) involves covalent chemical reactions that are reversible under certain experimental conditions. The field of DCC is attracting increasing attention because it offers an interesting alternative to the traditional approaches based on 'static covalent" and 'dynamic non-covalent' bonding.

DCC is applied in chemistry, materials and life sciences, for example, for the synthesis of bioactive compounds and porous materials, controlled delivery of therapeutics, fabrication of re-processable polymeric networks with a circular economy perspective, for healthcare biomaterials, and in systems chemistry. In particular, DCC that carries out under aqueous conditions can facilitate the realization of environmentally friendly solutions for pharmaceutical, biological and biomedical applications.

The main aim of this Symposium is to build a community of researchers working on DCC in water, both at the fundamental and applied fronts. The invited presentations will showcase recent developments of DCC in water at the molecular, materials and system's level; the use of innovative characterization techniques in water to elucidate reaction mechanisms, and the implementation of DCC-based tools for various applications. Moreover, local contributions will present ongoing research in dynamic systems that entail supramolecular chemistry, polymer chemistry and materials science from the UT.

Program

time	Session
08:30 – 09:00	**Welcome coffee/tea**
09:00- 09:10	Jeroen Cornelissen and Julieta Paez *Welcome and opening*
09:10 – 10:40	**Session 1. From (bio)molecules to interfaces and networks** Chair: Julieta Paez
09:10 – 09:40	Romen Carrillo (IPNA-CSIC Tenerife, Spain) *Dynamic covalent chemistry with tetrazines: Combining the best of both worlds*
09:40 – 10:10	Krishnendu Das (Molecular Nanofabrication, University of Twente) *Making Inactive to Active: Templating Effect over a Cooperative Catalytic System*
10:10 – 10:40	Ann-Christin Pöppler (University of Würzburg, Germany) *Worms, spheres and hydrogels - insights into the structural diversity of polymeric materials for drug delivery and tissue engineering applications*
10:40 – 11:00	**Coffee/tea break**
11:00 – 12:30	**Session 2. Polymeric materials: bioinspiration and molecular characterization** Chair: Jurriaan Huskens
11:00 – 11:30	Sebastian Seiffert (University of Mainz, Germany) *Dynamics and Relaxation of Transient Polymer-Network Gels in View of their Microstructure*
11:30 – 12:00	Olga Koshkina (Sustainable Polymer Chemistry, University of Twente) *Polyphosphoesters- from diverse, bioinspired macromolecules to advanced biomedical materials*.
12:00 – 12:30	Saskia Lindhoud (Molecular Nanofabrication, University of Twente)

Separation by (polyelectrolyte) complexation.

12:30 – 13:30	**Lunch**
13:30 – 15:00	**Session 3. Dynamic combinatorial and systems chemistry** Chair: Romen Carrillo
13:30 – 14:00	Albert Wong (Chemical Reaction Networks, University of Twente) *Chemical reaction networks with an application in brain-inspired computing*
14:00 – 14:30	Ruth Pérez-Fernández (Centro de Investigaciones Biológicas Margarita Salas, Spain) *Dynamic chemical systems to better understand biological targets*
14:30 – 15:00	Andrés de la Escosura (Universidad Autónoma de Madrid, Spain) Dynamic chemistry of biohybrid systems and materials
15:00 – 15:30	**Coffee/tea break**
15:30 – 17:00	**Session 4: Dynamic materials for biomedical applications** Chair: Albert Wong
15:30 – 16:00	Rienk Eelkema (TU Delft, The Netherlands) *Michael Addition Chemistry for Injectable Polymer Gels*
16:00 – 16:30	Julieta Paez (Developmental Bioengineering, University of Twente) *Reversible hydrogels with tunable viscoelastic properties for cell encapsulation*.
16:30 – 17:00	Pascal Jonkheijm (Molecular Nanofabrication, University of Twente) *Dynamic supramolecular systems to better interface with cells*
17:00 – 17:15	Aaron Torres Huerta (Université libre de Bruxelles, Belgium) *Dynamic covalent chemistry with azines*
17:15 – 17:30	Final remarks and end of the scientific program