

# Symposium Solar to Products

## Essential building blocks for a carbon neutral future

6 November 2019, DIFFER, De Zaaie 20, 5612 AZ Eindhoven

Welcome			
09:30	Welcome and registration		30'
09:55	Opening of the symposium	Stephan van Duren (NWO)	
Creating sustainable CO <sub>2</sub> -neutral fuels (CNF)			
	Past NWO program CO <sub>2</sub> -neutral fuels		60'
10:00	Highlights CNF program	Richard van de Sanden (DIFFER)	
10:20	Catalytic and electrochemical processes for energy applications	Mihalis Tsampas (DIFFER)	
10:40	Electrochemical materials and interfaces	Anja Bieberle (DIFFER)	
11:00	Break		15'
Storing and converting solar energy in chemical products			
	Present NWO program Solar-to-Products 1/2		60'
		Industry partners	Science partners
11:15	Photo thermocatalytic conversion of CO <sub>2</sub> and H <sub>2</sub> O to methanol	Guido Mul (UT)	Syngaschem B.V.
11:30	CO <sub>2</sub> valorisation in biogas by solar driven plasma reforming	Gerard van Rooij (TU/e)	SHELL
11:45	An integrated device to directly convert sunlight, water, and CO <sub>2</sub> to syngas using only earth abundant materials (DISCO)	Arno Smets (TUD)	SHELL Everest Coatings SME
12:00	Redox mediators in dye-sensitized photoelectrochemical cells for CO <sub>2</sub> reduction	Didjay Bruggeman (UvA)	Merck KGaA University of Amsterdam
12:15	Poster session (with lunch break)		90'
Storing and converting solar energy in chemical products			
	Present NWO program Solar-to-Products 2/2		60'
		Industry partners	Science partners
13:45	Darwin's path towards sustainability: exploring evolutionarily stable strategies in engineered biosolar cell factories	Filipe Branco dos Santos (UvA)	Photanol B.V. University of Amsterdam
14:00	Vibrationally stimulated electro-fuel production in a proton conducting solid oxide electrolysis cell" ("VISEP")	Stefan Welzel (DIFFER)	SHELL DIFFER Twente University
14:15	Design and optimization of a photoanode for solar fuel production	Francesco Buda (UL)	Scientific Computing & Modelling N.V. Leiden University Free University
14:30	Electrochemical reduction of CO <sub>2</sub> to ethylene	Petra de Jongh (UU)	SHELL TNO Twente University Leiden University Utrecht University
14:45	Break		15'
Panel Discussion - Triple Helix			
	Industry (supplier&user) / Government / Science		60'
15:00	Panel discussion with representatives from the triple helix How can we accelerate implementation of new technologies? What opportunities are ahead for industry? How can we bridge the gap between science and industry? What role can the government play? How to keep the general public involved in long term goals? How can we find a balance between short and long term goals?	Nicollé Lambrechts (Province Noord Brabant) Gert-Jan Gruter (Avantium) Ton Wurth (Siemens) Ton Peijnenburg (VDL-ETG) André Faaij (ECN part of TNO + University of Groningen)  <i>Panel Chair: Christa Hooijer (TNO)</i>	
16:00	Break		15'
Future - national and international activities / funding			
			75'
16:15	Future EU research program	Huub de Groot (UL)	
16:45	Dutch climate agreement: electrification and radical new processes	Andreas ten Cate (ISPT)	
17:00	Funding opportunities public-private collaboration	Marcel Hoek (NWO)	
17:15	Responsible innovation	Rietje van Dam (TKI BBE / MVI) Tessa Lansbergen (NWO / MVI)	
17:25	Closing	Stephan van Duren (NWO)	
17:30	Networking with drinks		60'
18:30	End of Solar-to-Products symposium		

## Poster session - Solar-to-Products 2019

ID	First author	Title	Affiliate
1	Abishek, Khetan	BAT-DB: Design of a combinatorial library of electroactive compounds for redox flow batteries	DIFFER
2	Askes, Sven	Preparation of plasmonic HfN nanoparticles for hot electron photochemistry	AMOLF
3	Belic, Jelena	Computational optimization of light absorbing dyes for the production of solar fuels	Free University Amsterdam
4	Blommaert, Marijn	Effect of Ion Transport on Performance of Bipolar Membrane	Delft University of Technology
5	Bruggeman, Didjay	Redox mediated water splitting in Dye Sensitized Photo Electrochemical Cells	University of Amsterdam
6	Burgt, Julia van der	Directivity for solar cells	Amolf institute
7	Grimm, Alexa	Process modeling and optimization for the production of carbon-neutral solar fuels	Utrecht University
8	Jansen, Charlotte	CO <sub>2</sub> to formate - unraveling hydrogenation of CO <sub>2</sub> to methanol	Leiden University
9	Jongbloets, Joeri	Paths towards sustainable phototrophic cell factories	University of Amsterdam
10	Laan, Marco van der	Effect of ligands on heterostructures of 2D layered MoS <sub>2</sub> and lead-halide perovskite nanocrystals	University of Amsterdam
11	Liang, Qiuhua	The Singular Role of Nickel doped Monolayer Nitrides as Efficient Catalysts for Water Oxidation	DIFFER
12	Marcandalli, Giulia	The Singular Role of Nickel doped A Study of CO <sub>2</sub> Electrochemical Reduction by Rotating Ring-Disk Electrode on Gold	Leiden University
13	Menzel, Jan Paul	Photoinduced electron injection and Charge separation in a Dye-sensitized Photoanode	Universiteit Leiden
14	Monai, Matteo	Towards C-C coupling products in CO <sub>2</sub> hydrogenation by exploiting metal-support interactions in Ni catalysts	Utrecht University
15	Mushtaq, Usman	Development and characterization of proton conducting solid oxide electrolysis cells for the production of solar fuels.	DIFFER
16	Oksenberg, Eitan	Direct absorption and scattering characterization of single plasmonic particles	AMOLF
17	Ong, Qin	Plasma Catalysis as Vibrational Activation of Surface Interactions	DIFFER
18	Sabatino, Francesco	A Novel Direct Air Capture Process Combining Wet Scrubbing and Bipolar Membrane Electrodialysis	Eindhoven University of Technology
19	Schuler, Eric	Formate coupling - a important step from CO <sub>2</sub> to materials	Universiteit Van Amsterdam
20	Silva, Ana	Validation of electron and heavy species kinetics in CO <sub>2</sub> discharges	DIFFER
21	Sinha, Vivek	Towards Multiscale Modelling of the Semiconductor-Electrolyte Interface for Oxygen Evolution Reaction	DIFFER
22	Sorkun, Murat Cihan	Discovering two-dimensional materials via artificial intelligence	DIFFER
23	Tezsevin, Ilker	Virtual materials library generation and high-throughput screening for CO <sub>2</sub> reduction and O <sub>2</sub> transport	DIFFER
24	Viegas, Pedro	Fokker-Planck approach to model vibrational kinetics of CO <sub>2</sub> plasma	DIFFER
25	Viswanathan, Narasimhan	Automated screening of single atom catalysts for solar fuel conversion	DIFFER, CCER
26	Vrijer, Thierry de	High voltage PV device for solar fuels	Delft University of Technology
27	Zafeiropoulos, Georgios	Visible light photoelectrochemical water splitting on W and Mo doped BiVO <sub>4</sub> porous photoanodes	DIFFER
28	Zhu, Shaochen	Investigations of Fe-substituted BaZrO <sub>3</sub> as a triple-conducting air electrode for protonic ceramic fuel cells	University of Twente
29	Tessa Lansbergen	Responsible innovation (banner/poster)	Dutch Research Council (NWO) MVI platform