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Research interests

Heterogeneous Catalysis

Homogeneous Catalysis

Green Chemistry:

Electrocatalysis:

Photocatalysis

Materials:

Supercritical CO₂

High-Throughput Experimentation

Research output

Activation of low-cost stainless-steel electrodes for efficient and stable anion-exchange membrane water electrolysis

Jiang, T., Zouridi, L., Li, N., Binas, V., Stuart, M. C. A., Aravind, P. V., Jayawardhana, B., Pescarmona, P. P. & Kyriakou, V., 21-Nov-2024, In: Journal of Materials Chemistry A. 2024, 43, p. 29909-29922 14 p.

Electrochemical and Non-Electrochemical Pathways in the Electrocatalytic Oxidation of Monosaccharides and Related Sugar Alcohols into Valuable Products

van der Ham, M. P. J. M., Creus, J., Bitter, J. H., Koper, M. T. M. & Pescarmona, P. P., 13-Nov-2024, In: Chemical reviews. 124, 21, p. 11915-11961 47 p.

Photochemical on-demand production of hydrogen peroxide in a modular flow reactor

Freese, T., Meijer, J. T., Miola, M., Pescarmona, P. P. & Feringa, B. L., 11-Nov-2024, (E-pub ahead of print) In: Sustainable Energy & Fuels. 11 p., d4se01142b.

Nanostructured Fe-Doped Ni₃S₂ Electrocatalyst for the Oxygen Evolution Reaction with High Stability at an Industrially-Relevant Current Density

Zhu, J., Chen, W., Poli, S., Jiang, T., Gerlach, D., Junqueira, J. R. C., Stuart, M. C. A., Kyriakou, V., Costa Figueiredo, M., Rudolf, P., Miola, M., Morales, D. M. & Pescarmona, P. P., 30-Oct-2024, In: ACS Applied Materials and Interfaces. 16, 43, p. 58520-58535 16 p.

Iron-enriched water electrolysis

Poli, S. (Inventor) & Pescarmona, P. P. (Inventor), 17-Oct-2024, Patent No. WO2024215196, 10-Apr-2024, Priority date 11-Apr-2023

Dissociation role on the catalytic activity of organic halides in CO₂ conversion to cyclic carbonates: Experimental and computational study

Hernández, E., Navarro, P., Pescarmona, P. P. & Palomar, J., Oct-2024, In: Journal of CO₂ Utilization. 88, 11 p., 102929.

Metal Borides: From Industrial Classics to Versatile Colloidal Nanocrystals for Energy, Catalysis, and Hard Coatings Applications

Hong, J., Mutalik, S., Pescarmona, P. P. & Protesescu, L., 12-Mar-2024, In: Chemistry of Materials. 36, 5, p. 2147-2164 18 p.

Evaluation of binderless LTA and SAPO-34 beads as CO₂ adsorbents for biogas upgrading in a vacuum pressure swing adsorption setup

Boer, D. G., van de Bovenkamp, H. H., Langerak, J., Bakker, B. & Pescarmona, P. P., 2024, In: Energy Advances. 3, 7, p. 1581-1593 13 p.

Dyes as efficient and reusable organocatalysts for the synthesis of cyclic carbonates from epoxides and CO₂

Chen, J., Chiarioni, G., Euverink, G. J. W. & Pescarmona, P. P., 10-Oct-2023, In: Green Chemistry. 25, p. 9744-9759 16 p.

Novel elastic rubbers from CO₂-based polycarbonates

Chiarioni, G., van Duin, M. & Pescarmona, P. P., 16-Aug-2023, In: Green Chemistry. 25, 19, p. 7612-7626 15 p.

ZSM-5/Silicalite-1 core-shell beads as CO₂ adsorbents with increased hydrophobicity

Boer, D. G., Asgar Pour, Z., Poli, S., Langerak, J., Bakker, B. & Pescarmona, P. P., Aug-2023, In: Materials Today Chemistry. 32, 101621.

Germanane and butyl-functionalized germanane as visible-light photocatalysts for the degradation of water pollutants

Giouis, T., Fang, S., Miola, M., Li, S., Lazanas, A., Prodromidis, M., Tekelenburg, E. K., Moschovas, D., Loi, M. A., Rudolf, P., Gournis, D. & Pescarmona, P. P., Jun-2023, In: Journal of Environmental Chemical Engineering. 11, 3, 12 p., 109784.

Zeolites as Selective Adsorbents for CO₂ Separation

Boer, D. G., Langerak, J. & Pescarmona, P. P., 13-Mar-2023, In: ACS Applied Energy Materials. 6, 5, p. 2634–2656 23 p.

Binderless Faujasite Beads with Hierarchical Porosity for Selective CO₂ Adsorption for Biogas Upgrading

Boer, D. G., Asgar Pour, Z., Langerak, J., Bakker, B. & Pescarmona, P. P., Mar-2023, In: Molecules. 28, 5, 15 p., 2198.

Nickel Boride (Ni₃B) Nanocrystals: From Solid-State Synthesis to Highly Colloidally Stable Inks

Hong, J., Mutalik, S., Miola, M., Gerlach, D., Mehrabi K, R., Ahmadi, M., Kooi, B. J., Portale, G., Rudolf, P., Pescarmona, P. P. & Protesescu, L., 28-Feb-2023, In: Chemistry of Materials. 35, 4, p. 1710-1722 13 p.

Unravelling and overcoming the challenges in the electrocatalytic reduction of fructose to sorbitol

Creus, J., Miola, M. & Pescarmona, P. P., 21-Feb-2023, In: Green Chemistry. 25, 4, p. 1658-1671 14 p.

Optimisation of the electrochemical conversion of CO₂ into formate in a flow cell configuration using a bismuth-based electrocatalyst

Miola, M., Chillé, D., Papanikolaou, G., Lanzafame, P. & Pescarmona, P. P., 31-Jan-2023, In: Green Chemistry. 25, 5, p. 1875-1883 9 p.

Binderless SAPO-34 beads for selective CO₂ adsorption

Boer, D. G., Čiliak, D., Langerak, J., Bakker, B. & Pescarmona, P. P., 2023, In: Sustainable Chemistry for Climate Action. 2, 9 p., 100026.

Engineering the Solid State Synthesis and Processing of Nickel Boride with Enhanced Functionality

Hong, J., Pescarmona, P. P. & Protesescu, L., 22-Dec-2022, *Sustainable Technology Forum València : Proceedings of MATSUS23*. FUNDACIO DE LA COMUNITAT VALENCIANA SCITO

Binder-free zeolite Beta beads with hierarchical porosity: Synthesis and application as heterogeneous catalysts for anisole acylation

Asgar Pour, Z., Koelewijn, R., El Hariri El Nokab, M., van der Wel, P., Sebakhy, K. O. & Pescarmona, P., 10-Oct-2022, In: ChemCatChem. 14, 19, 17 p., e202200518.

Binderless zeolite LTA beads with hierarchical porosity for selective CO₂ adsorption in biogas upgrading

Boer, D. G., Langerak, J., Bakker, B. & Pescarmona, P. P., Oct-2022, In: *Microporous and Mesoporous Materials*. 344, 11 p., 112208.

Polyalkylene carbonate obtained from biodegradable CO₂ and with self-healing properties

Sartore, L. (Inventor), Pandini, S. (Inventor), Pescarmona, P. P. (Inventor), Tang, Z. (Inventor), Gnali, L. (Inventor) & Sala, G. (Inventor), 9-Jun-2022, Patent No. WO2022118171, 29-Nov-2021, Priority date 1-Dec-2020

Process for preparing zinc dicarboxylate and use thereof as a catalyst in the synthesis of polyalkylene carbonate from CO₂ by heterogeneous catalysis

Tang, Z. (Inventor), Pescarmona, P. (Inventor), Sartore, L. (Inventor), Pandini, S. (Inventor), Gnali, L. (Inventor) & Sala, G. (Inventor), 9-Jun-2022, Patent No. WO2022118170, 29-Nov-2021, Priority date 1-Dec-2020

Ti and Zr amino-tris(phenolate) catalysts for the synthesis of cyclic carbonates from CO₂ and epoxides

Kamphuis, A. J., Tran, M., Picchioni, F. & Pescarmona, P. P., Jun-2022, In: *Green Chemical Engineering*. 3, 2, p. 171-179 9 p.

Pickering Emulsions and Antibubbles Stabilized by PLA/PLGA Nanoparticles

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Bimetallic Zeolite Beta Beads with Hierarchical Porosity as Brønsted-Lewis Solid Acid Catalysts for the Synthesis of Methyl Lactate

Pour, Z. A., Boer, D. G., Fang, S., Tang, Z. & Pescarmona, P. P., 9-Nov-2021, In: *Catalysts*. 11, 11, 15 p., 1346.

Novel non-ionic surfactants synthesised through the reaction of CO₂ with long alkyl chain epoxides

Alassmy, Y. A., Sebakhy, K. O., Picchioni, F. & Pescarmona, P. P., Aug-2021, In: *Journal of CO₂ Utilization*. 50, 8 p., 101577.

Highly-accessible, doped TiO₂ nanoparticles embedded at the surface of SiO₂ as photocatalysts for the degradation of pollutants under visible and UV radiation

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Cyclic carbonates synthesised from CO₂: Applications, challenges and recent research trends

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Pescarmona, P. P., 1-Jan-2021, *Materials and Energy: Handbook of Porous Materials*. Gitis, V. (ed.). 1 ed. World Scientific Publishing, Vol. 1. p. 149-176 28 p. (Materials and Energy; vol. 16, no. 1).

An Agent-Based Model of COVID-19 Diffusion to Plan and Evaluate Intervention Policies

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An efficient method to prepare supported bismuth nanoparticles as highly selective electrocatalyst for the conversion of CO₂ into formate

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WO₃-SiO₂ nanomaterials synthesized using a novel template-free method in supercritical CO₂ as heterogeneous catalysts for epoxidation with H₂O₂

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Mardani Ghahfarokhi, V., Pescarmona, P. P., Euverink, G.-J. W. & Poortinga, A. T., 10-Sept-2020, In: *Colloids and Interfaces*. 4, 3, 11 p., 40.

Efficient and Easily Reusable Metal-Free Heterogeneous Catalyst Beads for the Conversion of CO₂ into Cyclic Carbonates in the Presence of Water as Hydrogen-Bond Donor

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Pt/ZrO₂ Prepared by Atomic Trapping: An Efficient Catalyst for the Conversion of Glycerol to Lactic Acid with Concomitant Transfer Hydrogenation of Cyclohexene

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Efficient chemo-catalytic conversions of glycerol to lactic acid and derivatives

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Correction: Non-covalent polyhedral oligomeric silsesquioxane-polyoxometalates as inorganic–organic–inorganic hybrid materials for visible-light photocatalytic splitting of water (vol 5, pg 2666, 2018)

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Non-covalent polyhedral oligomeric silsesquioxane-polyoxometalates as inorganic–organic–inorganic hybrid materials for visible-light photocatalytic splitting of water

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Prof. Dr. Paolo P. Pescarmona is currently:

- Associate Professor in Sustainable Chemical Products and Catalysis at the University of Groningen, the Netherlands (since November 2017). The position encompasses research and teaching tasks, the management of the acquired funding and the supervision of post-doc, Ph.D. and Master projects. My research approach involves the rational design and development of catalytic materials for applications of academic, societal and industrial relevance, with a special focus on green chemistry. All aspects of the development of catalysts (heterogeneous and homogeneous) are covered: from the synthesis to the characterisation and testing. The targeted applications include CO₂ fixation, biomass conversion, catalytic oxidations, electrocatalysis, photocatalysis and the use of high-throughput techniques for the synthesis and testing of catalysts in liquid phase and in supercritical CO₂.
- President of the Dutch Zeolite Association (DZA) and Member of the Board of the Federation of European Zeolite Associations (FEZA) (since 9/2016).
- Member of the Board of the Dutch Catalysis Society (DCS, since 2017).
- Programme Director of the Master program in Chemical Engineering at the University of Groningen (since 1/2019).

Research interests

Heterogeneous Catalysis

Homogeneous Catalysis

Green Chemistry:

Electrocatalysis:

Photocatalysis

Materials:

Supercritical CO₂

High-Throughput Experimentation