



CATALOGUE 2025

www.polykey.eu



About us

POLYKEY is a science-driven company born in 2020 as a spin off from the POLYMAT Institute and the University of the Basque Country (UPV/EHU). Rethinking the polymer industry, POLYKEY aims to promote the sustainability of materials, from its sourcing to manufacturing, use and recycling.

POLYKEY offers products and technologies for a wide range of applications to reduce their carbon footprint, boost their performances and contribute to the circular economy. The products and technologies can be classified into three key areas: bio-sourced polymers, plastic recycling and innovative materials for energy storage.

International researchers with expertise in organic chemistry, polymer materials, and biology are constantly working on improving our products for customers and strategic partners. POLYKEY is committed to help the plastic industry achieving its sustainable goals on bio-sourced products, chemical recycling processes and innovative materials for energy storage.

A close-up photograph of vibrant green moss with numerous water droplets scattered across its surface, creating a fresh and natural aesthetic.

Bio-based Building blocks

With our sustainable process, bio-based building blocks can be produced that meet different application and processing needs.



p. 4

A photograph of crumpled orange paper, showing its textured and folded surface, which symbolizes recycling and reuse.

Molecules from recycling

The recycling of commodity polymers allows the recovery of high added-value building blocks for further polymerisation.



p. 8

A dark blue background featuring several glowing, wavy lines in shades of blue and orange, representing energy and technology.

Energy storage & bioelectronics

Our catalogue of molecules and polymers can boost the performance of your batteries as well as emerging bioelectronic devices.



p. 12

A grey background with a perspective view of a grid of dark grey lines, suggesting a structured and modern approach to services.

Services

To move from a linear plastic economy to a circular production, we offer tailored products and on-demand services.



p. 21

For assistance about orders, quotations or any other question or remark, please do not hesitate to contact our Customer Service Department at info@polykey.eu



Bio-based Building Blocks

POLYETHER POLYOLS

Through an innovative and sustainable process, our **bio-based polyether polyols** are synthesised to meet different application and processing needs.

Applications

...

Manufacturing of polyurethanes, poly(ether-esters) and poly(ether-amides).



Poly(1,6-hexanediol)

PK01

CAS 27236-13-1



Poly(1,8-octanediol)

PK02

CAS --



Poly(1,10-decanediol)

PK03

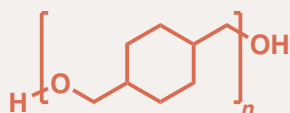
CAS 30444-76-9



Poly(1,12-dodecanediol)

PK04

CAS --



Poly(1,4-cyclohexanedimethanol)

PK05

CAS --



Poly(1,3-propanediol)

PK06

CAS 345260-48-2

POLYETHER POLYOLS

All our polyether polyols can be prepared in the range of $M_n = 500 - 2000 \text{ g}\cdot\text{mol}^{-1}$ and are certified with $< 500 \text{ ppm}$ of water.

Product	Functionality	T_m ($^{\circ}\text{C}$)	Viscosity @ 40 $^{\circ}\text{C}$ (cPs)	OH value ($\text{mgKOH}\cdot\text{g}^{-1}$)
PK01	1.8	55	Solid	40
PK02	1.8	68	Solid	36
PK03	2.0	80	Solid	32
PK04	2.0	85	Solid	30
PK05	4-5	-	11 500	260
PK06	1.9	16	900	58

The values shown above are typical values, not guaranteed values. Viscosity and OH value are determined for polyethers of $M_n = 2000 \text{ g}\cdot\text{mol}^{-1}$.

Properties

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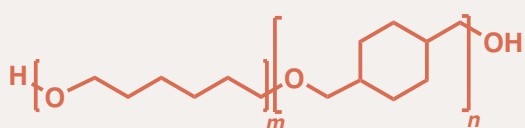
- High bio-based content ($>95\%$)
- Environmental-friendly technology
- High reactivity (bi-functional primary alcohol)
- Superior hydrolytic stability
- Tunable crystallinity

ON-DEMAND POLYETHER

On-demand co-polyether polyols

...

Our technology allows to prepare on-demand co-polyether polyols with tuned properties for meeting your application and processing needs.



Poly(1,6-hexanediol-*co*-1,4-cyclohexadimethanol)

PK(01-*co*-05)



Poly(1,6-hexanediol-*co*-1,3-propanediol)

PK(01-*co*-06)

Functionalised polyethers

...

Functionalised polyethers of defined length are also available. Do not hesitate to contact us for any specific demand.



Methacrylated poly(1,6-hexanediol)

Methacrylated PK01



Aminated poly(1,6-propanediol)

Aminated PK06



Molecules from Recycling

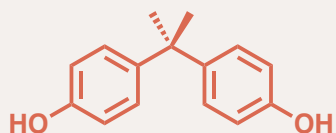
MONOMERS

Our unique portfolio of commodity polymers recycling technologies allows to recover typical monomers in high purity.

Applications

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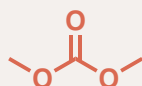
Polymerisation of PET, BPA-PC, and other polyesters and polycarbonates.



Bisphenol A

RK01 0101

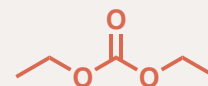
CAS 84-05-7



Dimethyl carbonate

RK01 0102

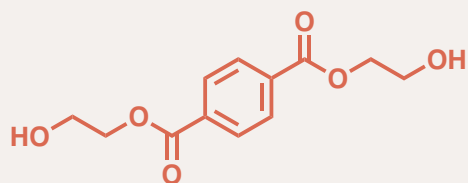
CAS 616-38-6



Diethyl carbonate

RK01 0103

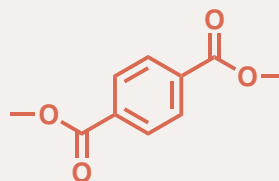
CAS 105-58-8



Bis(hydroxyethyl) terephthalate

RK01 0201

CAS 959-26-2



Dimethyl terephthalate

RK01 0202

CAS 120-61-6

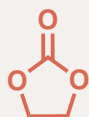
CYCLIC CARBONATES

Our unique technology of recycling of commodity polycarbonate (BPA-PC) leads to the synthesis of both 6- and 5-member **cyclic carbonates**.

Applications

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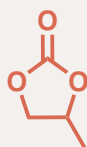
New building blocks for the synthesis of innovative polymers.



Ethylene carbonate

RK02 0101

CAS 96-49-1



Propylene carbonate

RK02 0102

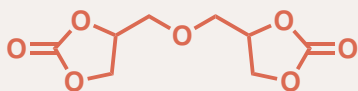
CAS 108-32-7



Glycerol carbonate

RK02 0103

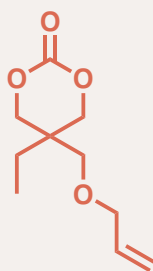
CAS 931-40-8



4,4'-[Oxybis(methylene)]bis
[1,3-dioxolan-2-one]

RK02 0104

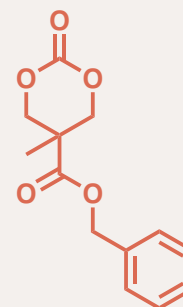
CAS 780-29-0



5-Ethyl-5-[(2-propen-1-yloxy)
methyl]-1,3-dioxan-2-one

RK02 0201

CAS 3536-64-9



Phenylmethyl 5-methyl-2-oxo-
1,3-dioxane-5-carboxylate

RK02 0202

CAS 247142-68-3

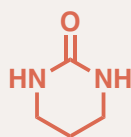
UREAS

Our unique technology of recycling of commodity polycarbonate (BPA-PC) leads to the synthesis of **cyclic and linear ureas**.

Applications

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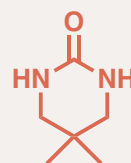
Batteries, 3D printing, NIPUs, biomedicine or electronics, polyurethanes, catalysis.



Tetrahydro-2-pyrimidinone

RK03 0101

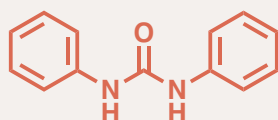
CAS 1852-17-1



5,5-dimethyl-1,3-diazinan-2-one

RK03 0102

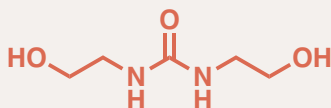
CAS 17496-93-4



N,N'-Diphenyl urea

RK03 0201

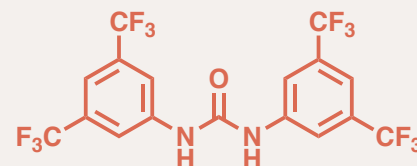
CAS 102-07-8



N,N'-Bis(2-hydroxyethyl)urea

RK03 0202

CAS 15438-70-7



Schreiner Catalyst

RK03 0203

CAS 3824-74-6

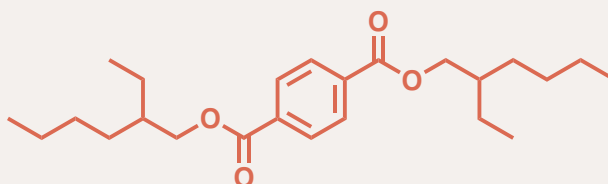
TEREPHTHALIC DERIVATIVES

The treatment of poly(ethylene terephthalate) (PET) with appropriate reagents allow the synthesis of **innovative aromatic structures**.

Applications

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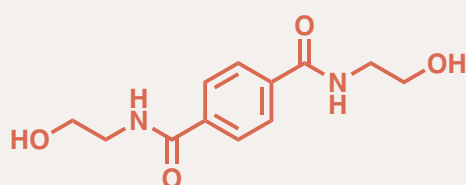
New building blocks for the synthesis of innovative polymers.



Dioctyl terephthalate

RK04 0101

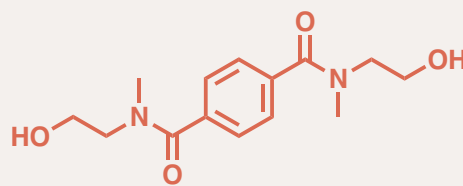
CAS 6422-86-2



Bis(2-hydroxyethyl) terephthalamide

RK04 0201

CAS 18928-62-6

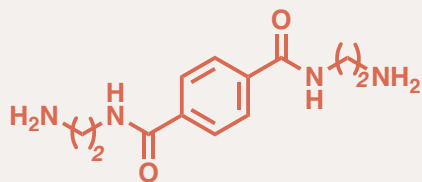


Bis(2-hydroxyethyl)dimethyl terephthalamide

RK04 0202

CAS 912572-56-6

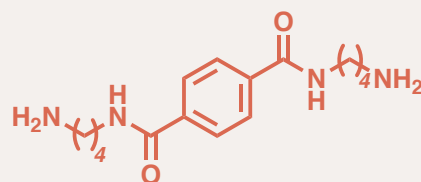
TEREPHTHALIC DERIVATIVES



*N*₁,*N*₄-bis(2-aminoethyl) terephthalamide

RK04 0301

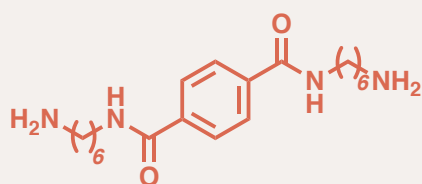
CAS 17197-13-6



*N*₁,*N*₄-bis(4-aminobutyl) terephthalamide

RK04 0302

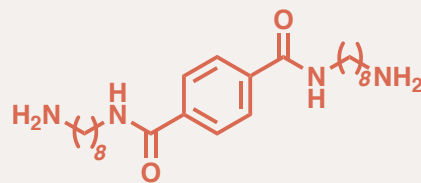
CAS 111623-75-7



*N*₁,*N*₄-bis(6-aminoethyl) terephthalamide

RK04 0303

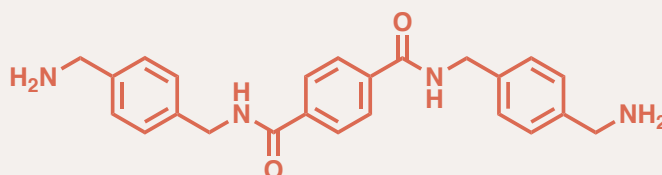
CAS 65775-38-4



*N*₁,*N*₄-bis(8-aminooctyl) terephthalamide

RK04 0304

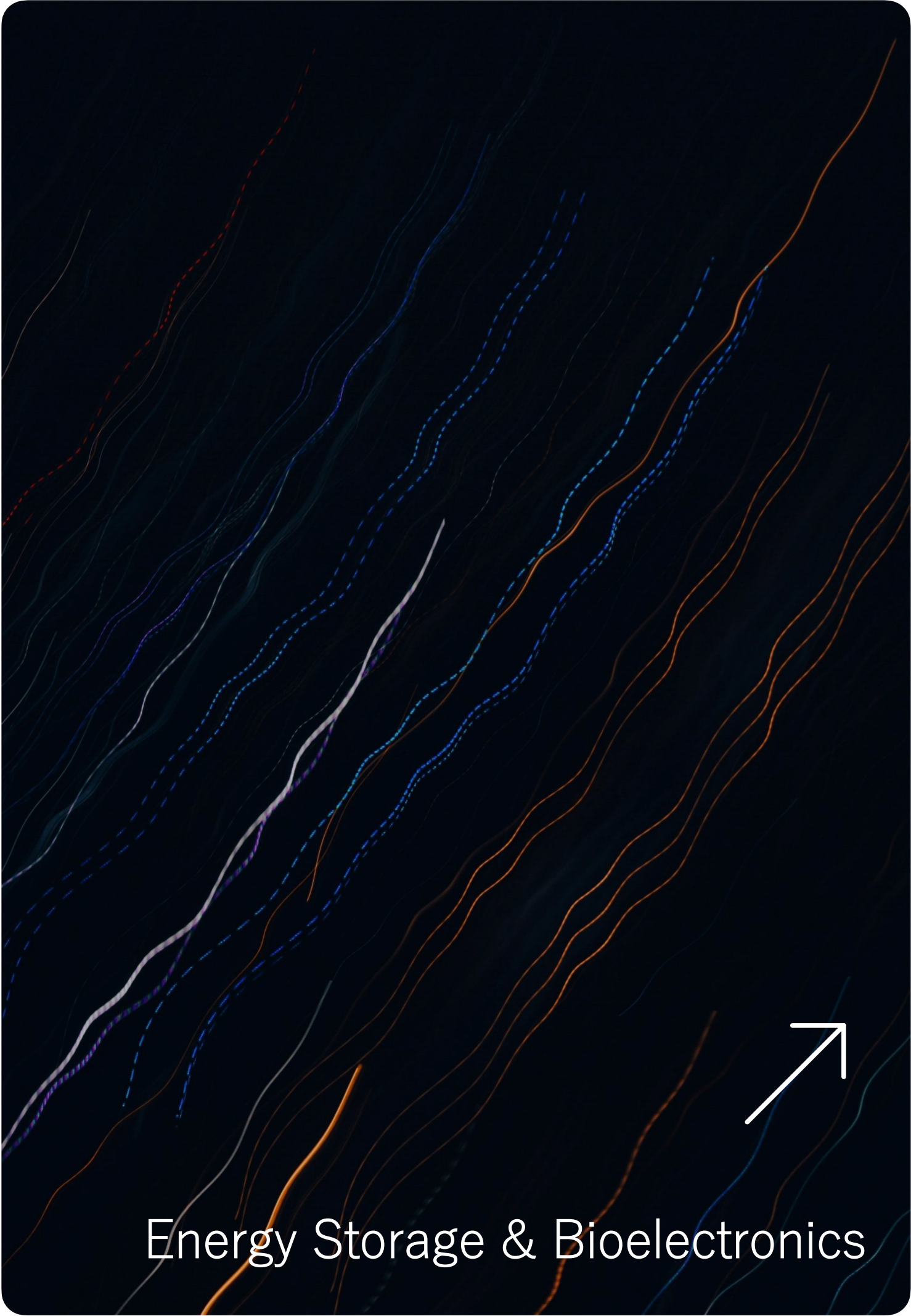
CAS 587875-99-8



*N*₁,*N*₄-Bis(4-(Aminomethyl)Benzyl) terephthalamide

RK04 0305

CAS 403735-00-2



Energy Storage & Bioelectronics

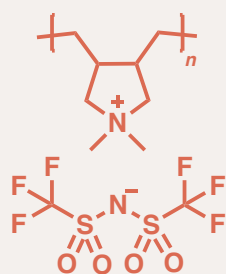
POLY(DADMA) POLY(IONIC LIQUID)S

Polydiallyldimethylammonium (Poly(DADMA)) poly(ionic liquid)s are available with various counter anions in different molecular weight, $M_n = <100\ 000, 200\ 000 - 350\ 000$ or $400\ 000 - 500\ 000\ \text{g}\cdot\text{mol}^{-1}$.

Applications

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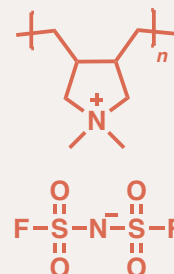
Polymer electrolytes and functional binders compatible with high voltage cathodes for various types of batteries, specifically Li-ion.



Poly(DADMA) tri(fluoromethanesulfonyl)imide

EK01 0101

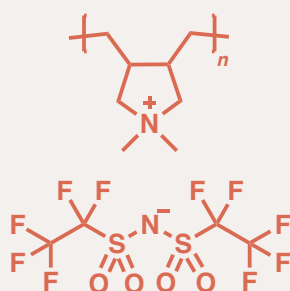
CAS 521942-10-9



Poly(DADMA) bis(fluorosulfonyl)imide

EK01 0102

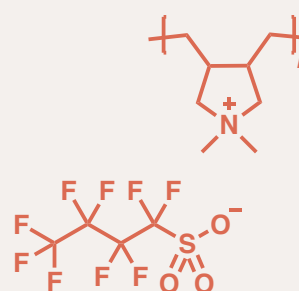
CAS 1883729-87-0



Poly(DADMA) bis(pentafluoroethanesulfonyl)imide

EK01 0104

CAS 679843-94-8



Poly(DADMA) nanofluorobutane sulfonate

EK01 0106

CAS --

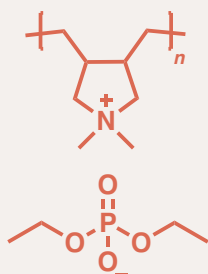
POLY(DADMA) POLY(IONIC LIQUID)S

New fluorine-free poly(DADMA) specifically designed for binders compatible with a wide variety of battery chemistries. Available in different molecular weights, $M_n = <100\ 000, 200\ 000 - 350\ 000$ or $400\ 000 - 500\ 000\ \text{g}\cdot\text{mol}^{-1}$.

Applications

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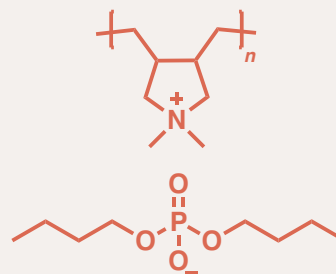
Functional binders and ionomers compatible with different types of electrochemical devices (batteries, fuel cells, sensors and electrolyzers)



Poly(DADMA) diethyl phosphate

EK01 0107

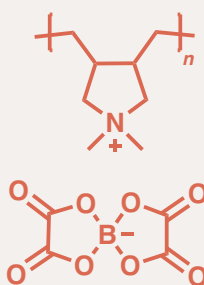
CAS --



Poly(DADMA) dibutyl phosphate

EK01 0108

CAS --



Poly(DADMA) bis(oxalate borate)

EK01 0109

CAS --

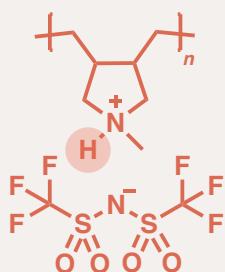
POLY(DAMA) POLY(IONIC LIQUID)S

Our new range of protic ionic liquids include polydiallylmethylammonium (poly(DAMA)) conceived for the performance of innovative **hydrogen technologies** and a **zwitterionic** poly(DAMA).

Applications

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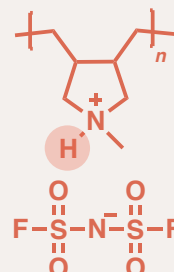
Proton exchange membranes, electrolyzers, fuel cells, polymer electrolytes or functional binders for batteries.



Poly(DAMA) tri(fluoromethanesulfonyl)imide

EK01 0201

CAS 3026543-94-9



Poly(DADMA) bis(fluorosulfonyl)imide

EK01 0202

CAS --



Poly(*N,N*-diallyl-*N*-methylpropanesulfonate)

EK01 0203

CAS 30604-59-2

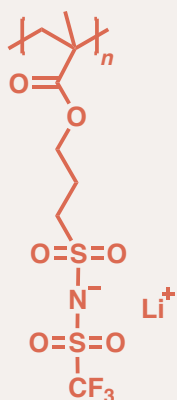
SINGLE-ION CONDUCTING POLYMERS

Sulfonamide single-ion conducting polymers specifically designed for Lithium (Li), Sodium (Na) or Potassium (K) batteries.

Applications

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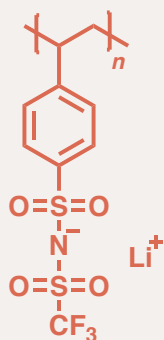
Polymer electrolyte for solid-state batteries. Available on-demand with Na and K ions.



Poly(lithium trifluoromethane sulfonimide methacrylate)

EK02 0102

CAS 1818373-10-2



Poly(lithium trifluoromethane sulfonimide styrene)

EK02 0103

CAS 215815-17-1

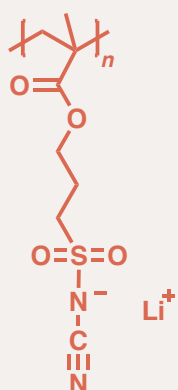
SINGLE-ION CONDUCTING POLYMERS

Fluorine-free single-ion conducting polymers specifically designed for Lithium (Li), Sodium (Na) or Potassium (K) batteries.

Applications

...

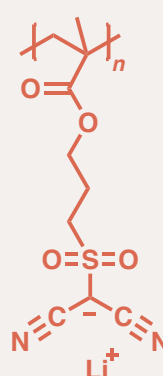
Polymer electrolyte and binders for solid-state batteries. Available on-demand with Na and K ions.



Poly(lithium cyanosulfonamide methacrylate)

EK02 0104

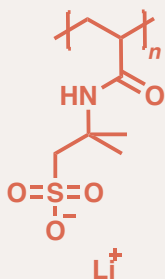
CAS 28931-95-4



Poly(lithium sulfonyl(dicyano) methide methacrylate)

EK02 0105

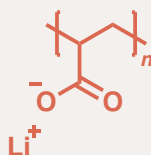
CAS --



Poly(lithium methylacrylamido-2-methyl-1-propanesulfonate)

EK02 0201

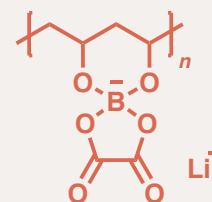
CAS 123661-26-7



Lithium polyacrylate

EK02 0202

CAS 25656-42-2



Lithium poly(vinyl alcohol oxalate borate)

EK02 0203

CAS --

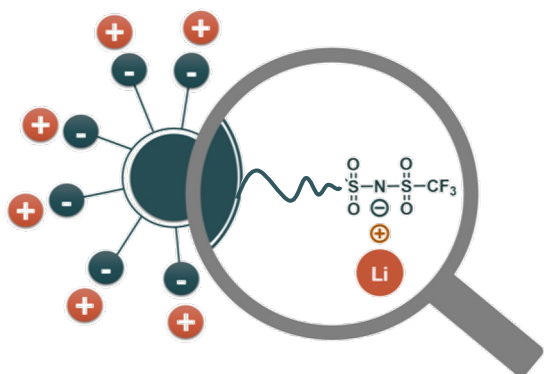
SINGLE-ION NANOPARTICLES

Sulfonamide polymers specifically designed for Lithium, Sodium or Potassium batteries are available in the form of polymer cross-linked nanoparticles for more efficiency.

Applications

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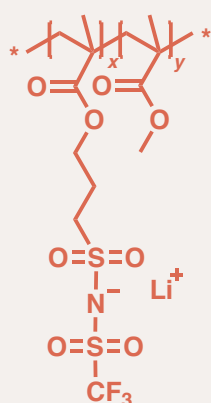
Additives for improving mechanical properties and conductivity of solid-state batteries.
Available on-demand with Na and K ions.



Nanoparticles of single-ion conducting polymers

...

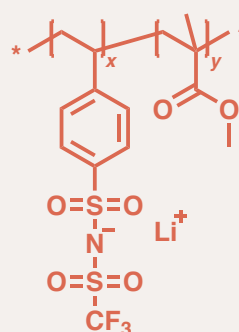
- Size range 30 – 60 nm
- Polymer core of Poly(methyl methacrylate) (PMMA) or polystyrene (PS)
- Variable composition of Lithium sulfonamide co-monomer



Nanoparticles of
Poly(LiMTFSI₂₀-co-MMA₈₀)

EK02 0102N

CAS --



Nanoparticles of
Poly(LiSTFSI₂₀-co-MMA₈₀)

EK02 0103N

CAS --

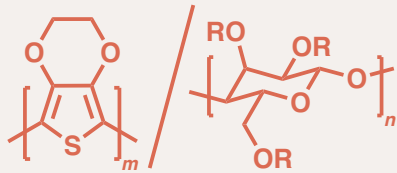
PEDOT/BIOPOLYMERS

Aqueous dispersions of conducting polymers based on PEDOT and water-soluble biopolymers.

Applications

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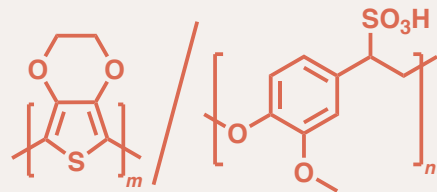
Conductive additives and water-soluble binders.



PEDOT/Carboxymethyl cellulose

EK04 01

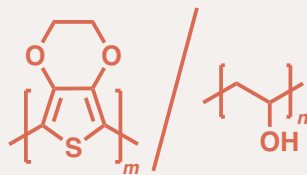
CAS 126213-51-2/9000-11-7



PEDOT/Lignin sulfonate

EK04 02

CAS 126213-51-2/8062-15-5

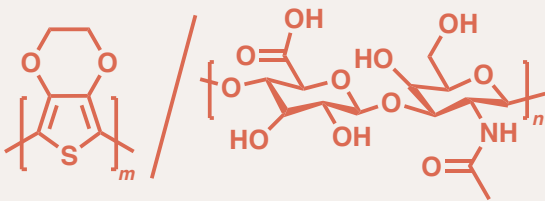


PEDOT/Polyvinyl alcohol

EK04 03

CAS 126213-51-2/9002-89-5

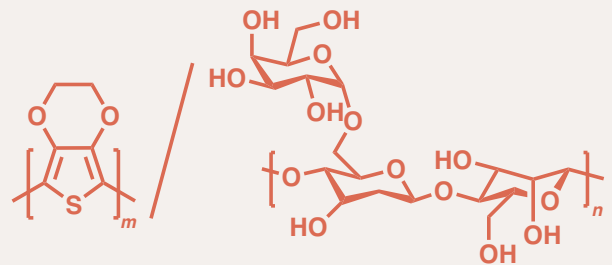
PEDOT/BIOPOLYMERS



PEDOT/Hyaluronic acid

EK04 04

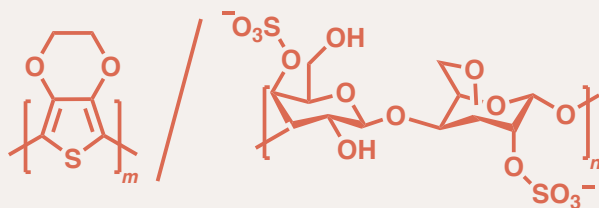
CAS 126213-51-2/9004-61-9



PEDOT/Guar gum

EK04 05

CAS 126213-51-2/9000-30-0



PEDOT/Carrageenan

EK04 06

CAS 126213-51-2/9000-07-1

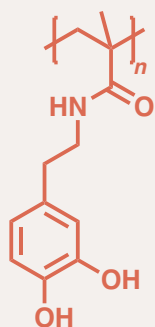
REDOX POLYMERS

High voltage biocompatible **poly(catechol)** polymers for energy storage and bioelectronics with adhesion properties.

Applications

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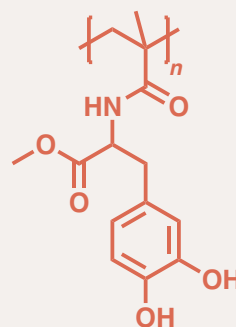
Organic electrodes, redox-active binders, biocompatible and adhesive coatings.



Poly((3,4-dihydroxyphenylethyl)-2-propenamamide)

EK03 0201

CAS 1370714-45-6



Poly(*N*-methacryloyl-3,4-dihydroxy-L-phenylalanine methyl ester)

EK03 0202

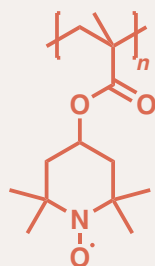
CAS 1421067-53-9

Nitroxide radical polymers for energy storage and electrochemical applications.

Applications

...

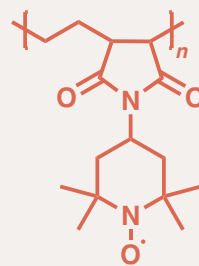
Organic batteries, redox-active binders, (bio)sensors.



Poly((2,2,6,6-Tetramethylpiperidin-1-oxyl methacrylate)

EK03 0301

CAS 28408-25-5



Poly(ethylene-alt-maleic anhydride)-(2,2,6,6-Tetramethylpiperidin-1-oxyl)

EK03 0302

CAS --

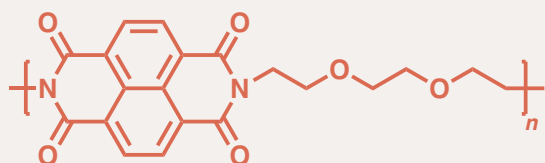
REDOX POLYMERS

Stable carbonyl redox polymers including poly(anthraquinonyl sulphide), naphthalenic and perylenic poly(imides).

Applications

...

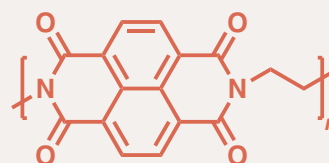
Organic electrodes, redox-active binders and redox flow batteries.



Poly(naphthalene-4-formyl-2,2'-(Ethylenedioxy) bis(ethylamine))

EK03 0401

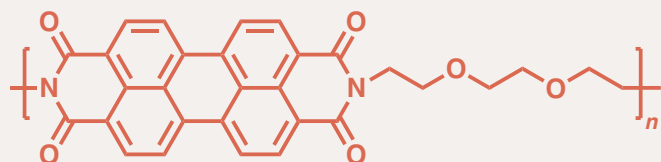
CAS 203632-72-8



Poly(naphthalene-4-formylethylenediamine)

EK03 0402

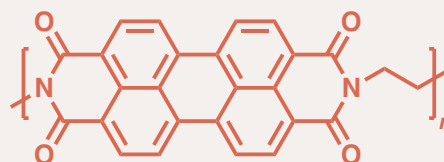
CAS 124087-24-7



Poly(perylene-4-formyl-2,2'-(Ethylenedioxy) bis(ethylamine))

EK03 0501

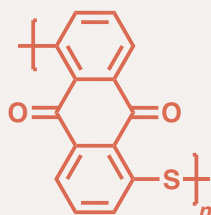
CAS 1429920-52-4



Poly(perylene-4-formylethylenediamine)

EK03 0502

CAS 188713-48-6



Poly(anthraquinonyl sulfide)

EK03 06

CAS 1128177-28-5

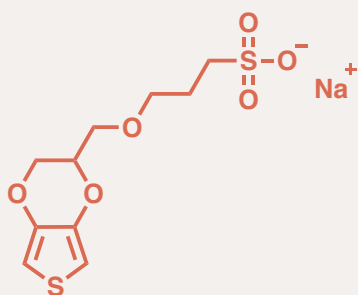
THIOPHENE-BASED MATERIALS

Water soluble anionic and cationic thiophene-based monomers and polymers.

Applications

...

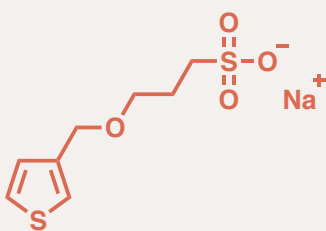
Electronic conductive materials for (bio)electronics.



Hydroxymethyl EDOT
sodium propane sulfonate

EK05 0101

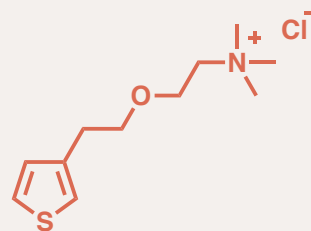
CAS 146796-10-3



Thiophene methanol
sodium propane sulfonate

EK05 0201

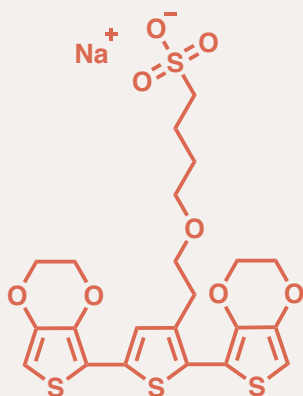
CAS --



Thiophene methanol chlorine
ethyl-trimethylammonium

EK05 0202

CAS --



ETE-S Trimer

EK05 03

CAS --

On-demand Trimer

...

Thiophene-based trimers can be synthesised on-demand for meeting your requirements.

- Length of the glycol chain
- Anion or cation
- Nature of the counterion
- ...

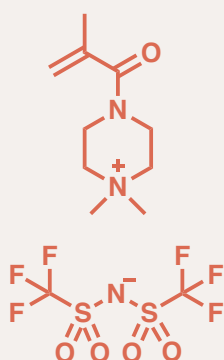
IONIC LIQUID MONOMERS

Precursors of versatile poly(ionic liquid)s, including on-demand design of protic and aprotic ionic liquid monomers.

Applications

...

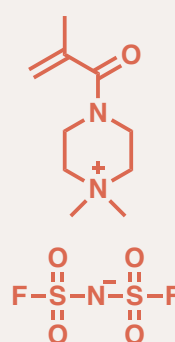
Wide range of applications in energy, cellulose processing, analytics, lubricants, corrosion-protection, ionogels, (bio)electronics...



Methyl piperazinium methacrylate
tri(fluoromethanesulfonyl)imide

EK06 0101

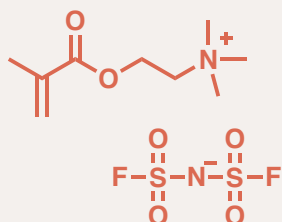
CAS --



Methyl piperazinium methacrylate
bis(fluorosulfonyl)imide

EK06 0102

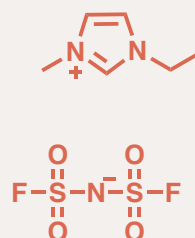
CAS --



Methacrylylcholine
bis(fluorosulfonyl)imide

EK06 02

CAS 1246462-74-7



1-Ethyl-3-methylimidazolium
bis(fluorosulfonyl)imide

EK06 03

CAS 235789-75-0

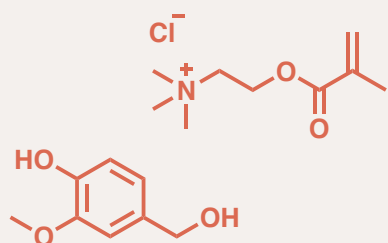
DEEP EUTECTIC MONOMERS

Deep eutectic monomers based on methacrylic ammonium chloride and biobased polyphenols with catechol or pyrogallol motifs as precursors of PolyDES.

Applications

...

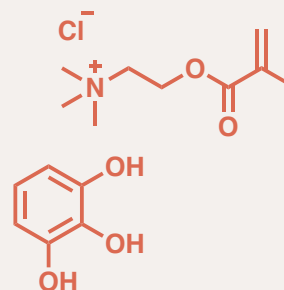
Biobased coatings with adhesive or elastomeric properties, monomers for poly(deep eutectic) for metal complexation, antibacterial materials or 3D printing.



Vanilic alcohol [2-(Methacryloyloxy)ethyl]
trimethylammonium chloride

EK07 01

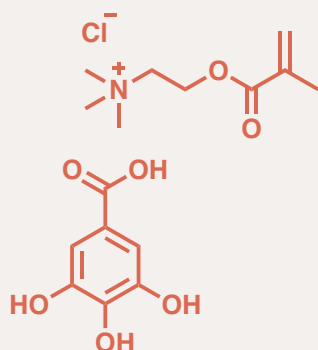
CAS 121-34-6/5039-78-1



Pyragollol [2-(Methacryloyloxy)ethyl]
trimethylammonium chloride

EK07 02

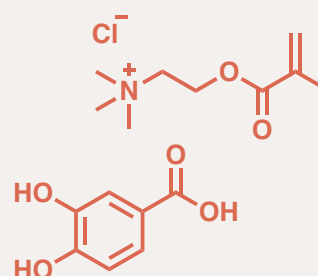
CAS 87-66-1/5039-78-1



Gallic acid [2-(Methacryloyloxy)ethyl]
trimethylammonium chloride

EK07 03

CAS 149-91-7/5039-78-1



Protocatechuic acid [2-(Methacryloyloxy)ethyl]
trimethylammonium chloride

EK07 04

CAS 99-50-3/5039-78-1

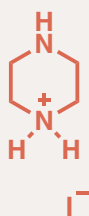
PIPERAZINIUM SALTS

Piperazinium salts with different anions optimised for surface treatment to increase the performance and stability of perovskite solar cells.

Applications

...

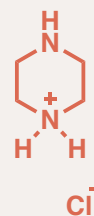
Perovskite solar cells.



Piperazinium iodide

EK08 01

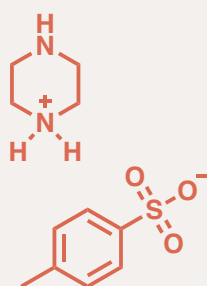
CAS 56310-12-4



Piperazinium chloride

EK08 02

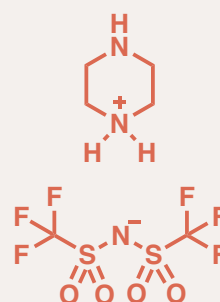
CAS 7542-23-6



Piperazinium tosylate

EK08 03

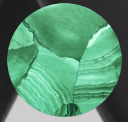
CAS 856352-67-5



Piperazinium bistriflimide

EK08 04

CAS 551952-15-9



Services

To move from the current unsustainable linear plastic consumption to a circular economy, we offer tailored products and on-demand services.



On-demand polymer synthesis



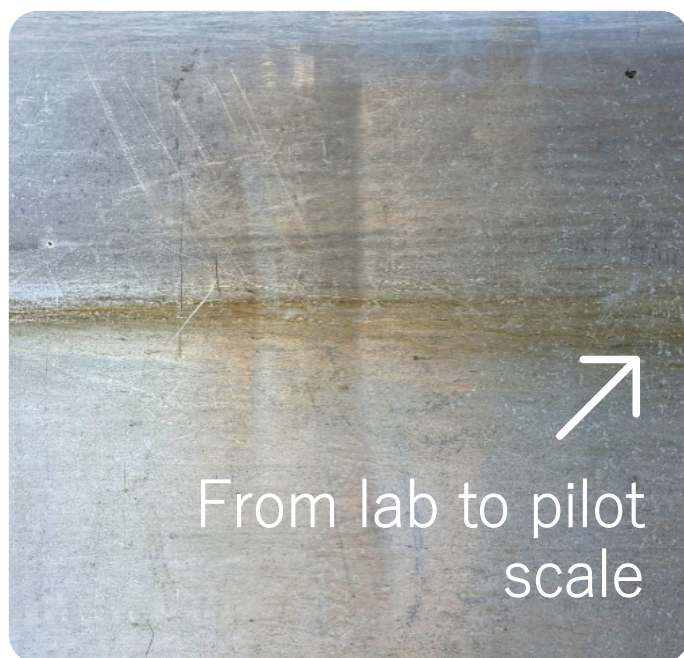
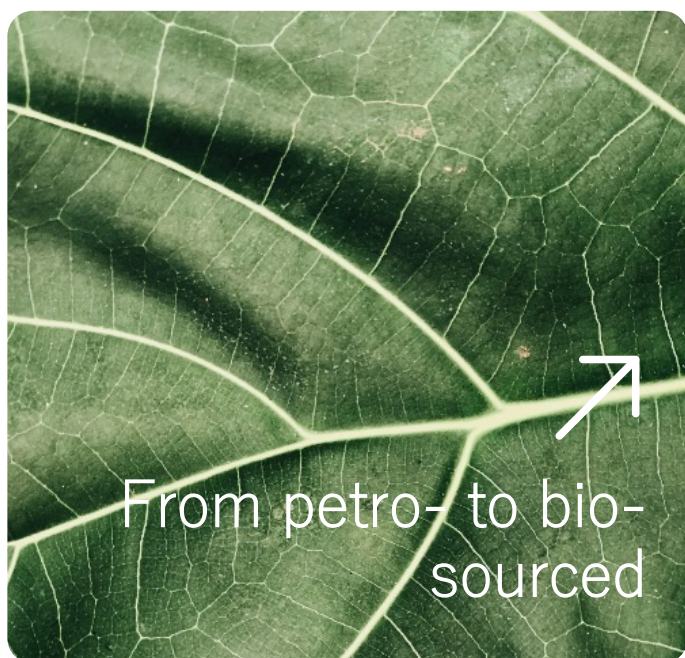
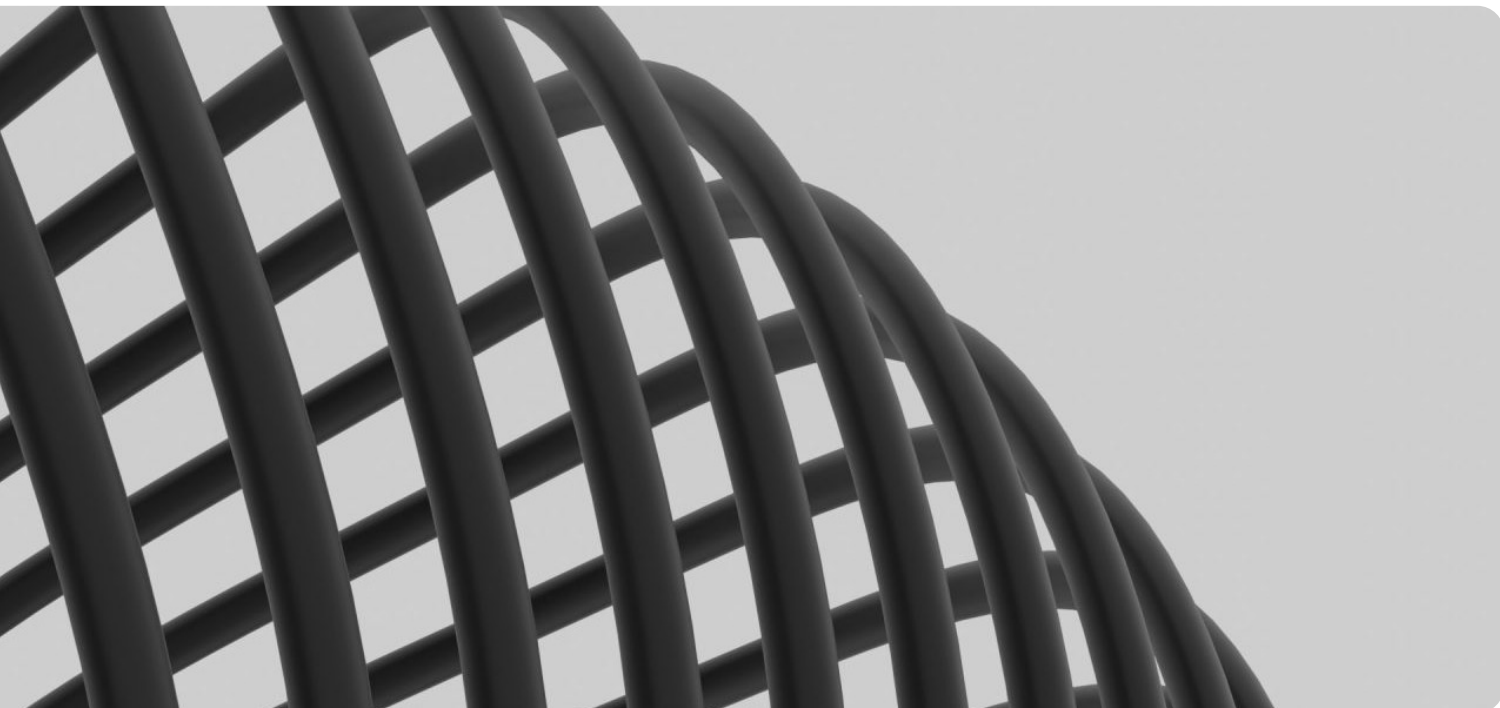
Recycling plastic wastes

Our scientific supervision is counting with an experience of more than 25 years in the synthesis of polymers and materials for valuable applications, including batteries, bioelectronics, bio-sourced materials, NIPUs, block polymers, etc.

- Functional polymers
- Polymers from renewable resources
- Polymers for bioelectronics

With a solid expertise in recycling methodologies and two registered patents, POLYKEY is your expert in depolymerisation for developing a tailored recycling reaction under mild conditions.

- Recycling of blends and multilayers
- Analysis of plastic waste composition
- Recycling of a plastic or a mixture
- Eco-design for better recycling



Want to improve the sustainability of your product or technology? POLYKEY can help you on adapting your methodologies for improving your overall impact.

- Use of bio-sourced synthons
- Change for organocatalysis
- Eco-design for improved assessment
- Sustainable improvement of processes

With partially automatised pre-pilot and pilot equipment, we are experts in the scale up of polymerisation and depolymerisation reactions from gram to kilogram scale.

- Capacity up to 35 L
- Glass and metallic reactors
- Automatised system
- High vacuum and temperatures

Polymer solutions for a



sustainable future



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(+34) 943 229 677
info@polykey.eu

