



PRODUCT CATALOGUE

2023

www.polykey.eu

About us

POLYKEY is a science-driven company born in 2020 as a spin off from the POLYMAT Institute together with 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, physics and biology are constantly working on improving the cost and sustainability of POLYKEY products for customers and strategic partners. POLYKEY is committed to help the plastic industry achieving its sustainable goals on renewable products, chemical recycling processes and innovative materials for energy storage.

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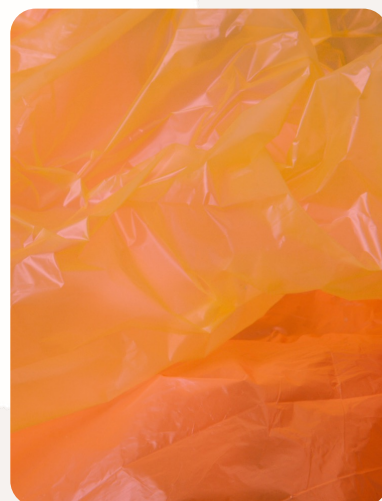
Bio-based Polyether Polyols

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

02

Molecules from Polymer Recycling

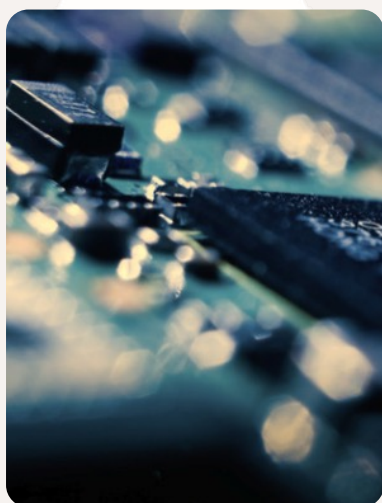
The recycling of commodity polymers allows the recovery of high added-value building blocks for further polymerisation.



03

Materials for Energy & Bioelectronics

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

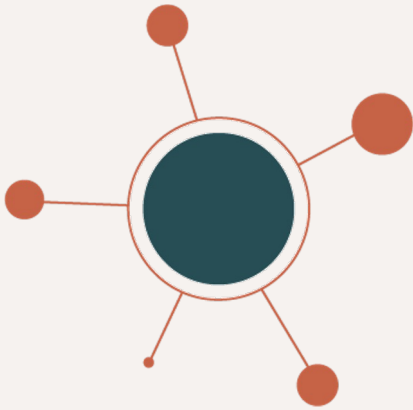






01

Bio-based Polyether
Polyols



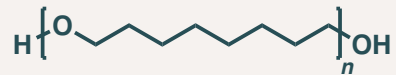
POLYETHER POLYOLS

Through a 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).



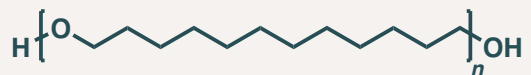
Poly(1,6-hexanediol)
PK01



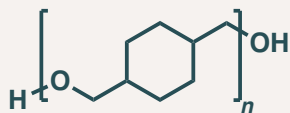
Poly(1,8-octanediol)
PK02



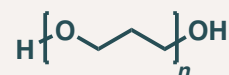
Poly(1,10-decanediol)
PK03



Poly(1,12-dodecanediol)
PK04



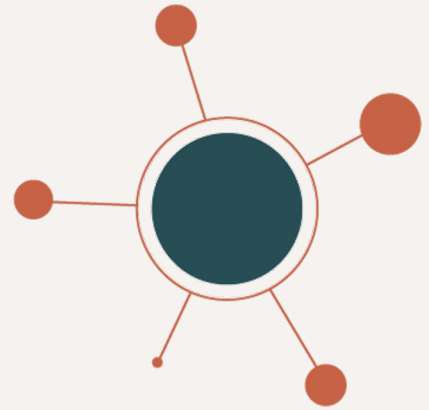
Poly(1,4-cyclohexanedimethanediol)
PK05



Poly(1,3-propanediol)
PK06

POLYETHER POLYOLS

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

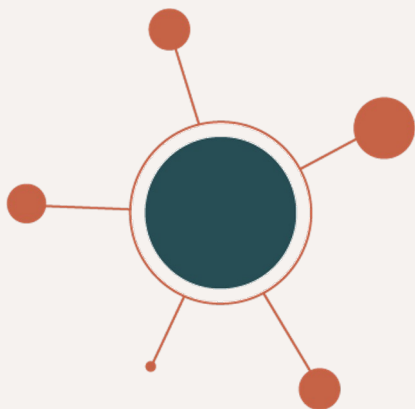


Product	Functionality	T_m (°C)	Viscosity @ 40 °C (cPs)	OH value (mgKOH·g ⁻¹)
PK01	1.7	55	Solid	40
PK02	1.8	68	Solid	36
PK03	2.0	80	Solid	32
PK04	2.0	85	Solid	30
PK05	4-5	-	11 500	260
PK06	1.9	16	900	58

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

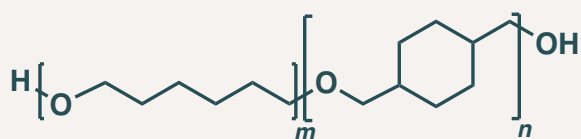
- High bio-based content (>95%)
- Environmentally friendly technology
- High reactivity (bi-functional primary alcohol)
- Superior hydrolytic stability
- Tunable crystallinity



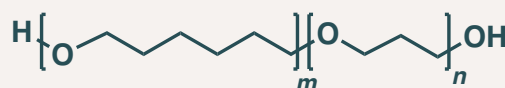
ON-DEMAND POLYETHERS

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.



PK(01-co-05)



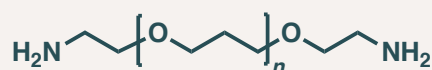
PK(01-co-06)

FUNCTIONALISED POLYETHER

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



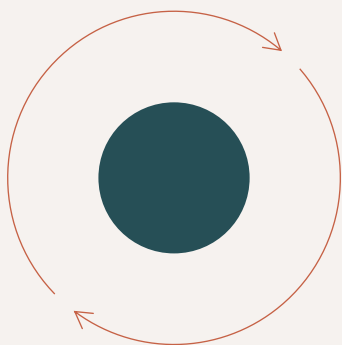
Methacrylated PK01



Aminated PK06

02

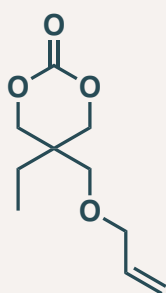
Molecules from Polymer Recycling



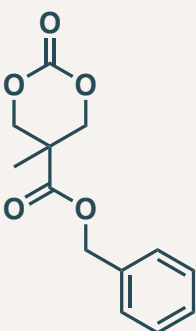
CYCLIC CARBONATES

The recycling of commodity polycarbonate (BPA-PC) allows the recovery of **cyclic carbonates** building blocks.

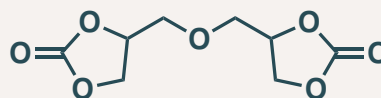
Applications - Innovative building blocks for the synthesis of polymers.



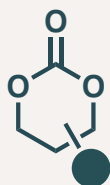
RK02 02



RK02 03



RK02 04



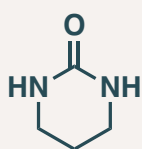
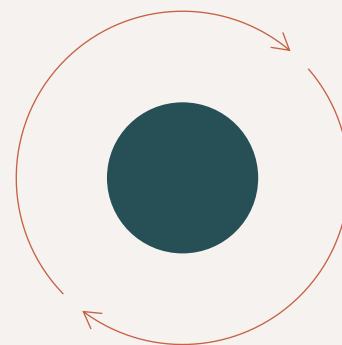
ON-DEMAND CYCLIC CARBONATES

Functionalised 6-member cyclic carbonates obtained from the recycling of BPA-PC are available on-demand. Ask for your quotation!

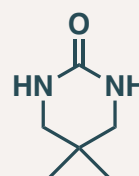
UREAS

The recycling of commodity polycarbonate (BPA-PC) allows the recovery of cyclic and linear ureas building blocks for polymerisation.

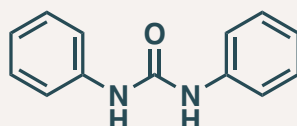
Applications - Batteries, 3D printing, NIPUs, biomedicine or electronics, polyurethanes, catalysis.



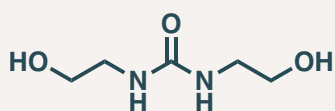
RK02 05



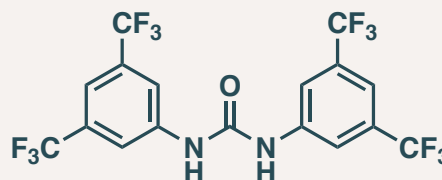
RK02 06



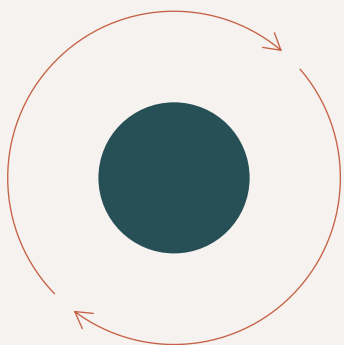
RK03 01



RK03 02



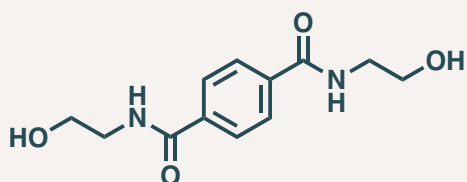
RK03 03



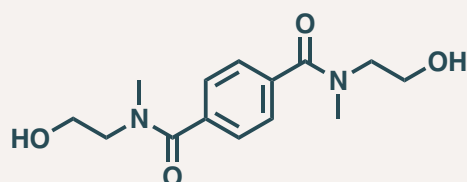
TEREPHTHALIC DERIVATIVES

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

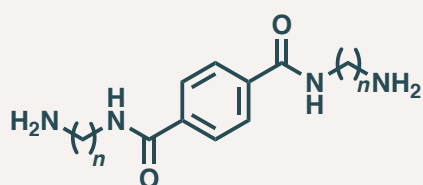
Applications - Innovative building blocks for the synthesis of polymers.



RK04 01

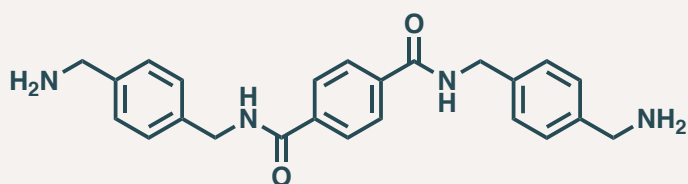


RK04 02

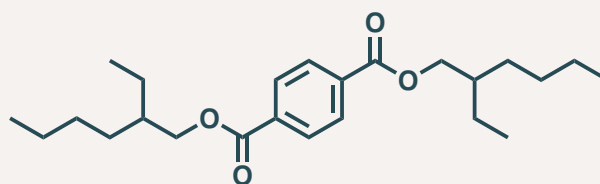


RK04 03-0X

Name	<i>n</i>
RK04 03-01	2
RK04 03-02	4
RK04 03-03	6
RK04 03-04	8



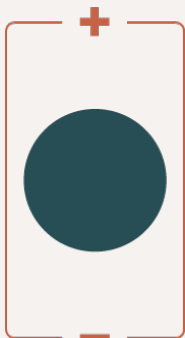
RK04 03-05



RK04 04

03

Energy Storage and Bioelectronics

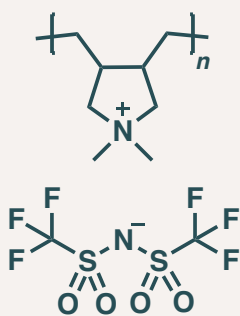


POLY(DADMA) POLY(IONIC LIQUID)S

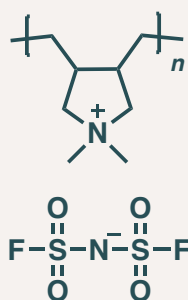
Poly(DADMA) with various counter anions.

Available with $M_n = <100\ 000, 200\ 000 - 350\ 000$ or $400\ 000 - 500\ 000\ \text{g}\cdot\text{mol}^{-1}$.

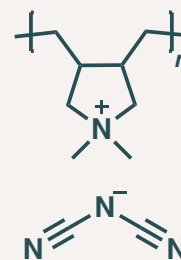
Applications - Polymer electrolytes, functional binders compatible with high voltage cathodes for Li-ion batteries.



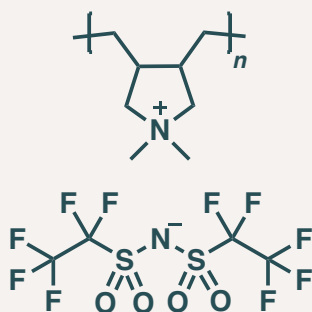
EK01 01-01



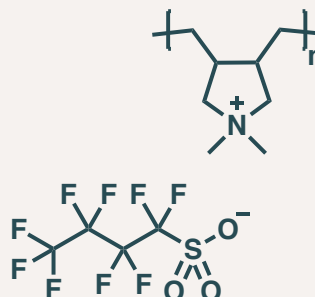
EK01 01-02



EK01 01-03



EK01 01-04

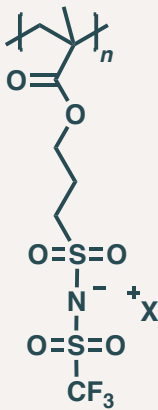
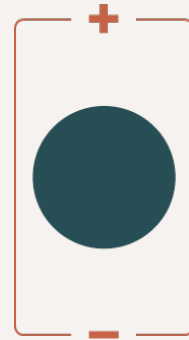


EK01 01-06

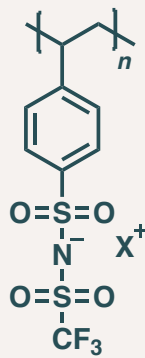
CONDUCTING ANIONIC POLYMERS

Sulfonamide and sulfonate single-ion conducting polymers specifically designed for Lithium, Sodium or Potassium batteries.

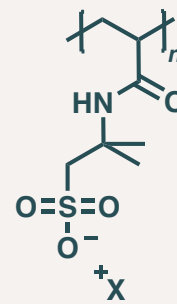
Applications - Solid state batteries.



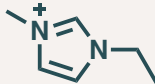
EK02 02-0X

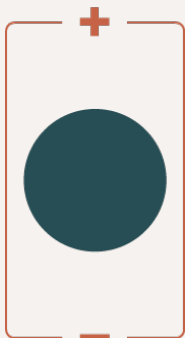


EK02 03-0X



EK02 05-0X

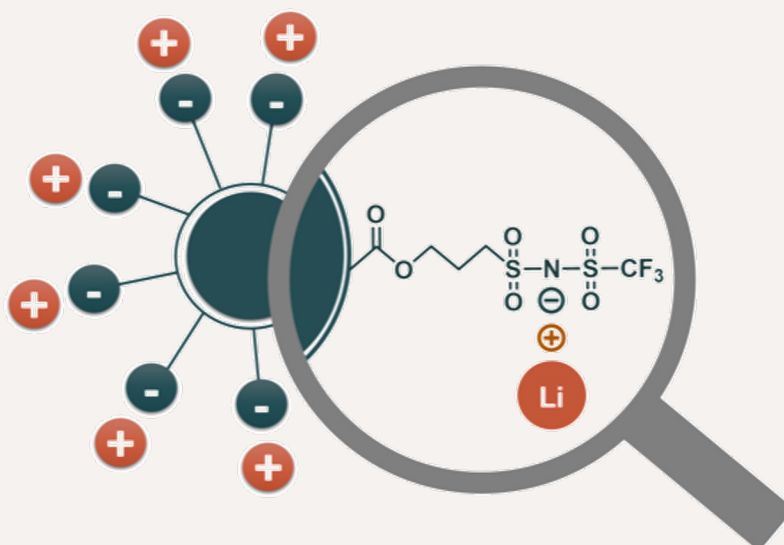
Name	Ion (X ⁺)
Inorganic cation	
EK02 02/03/05-01	Li ⁺
EK02 02/03/05-02	Na ⁺
EK02 02/03/05-03	K ⁺
Organic cation	
EK02 02/03/05-04	



NANOPARTICLES

Polymer nanoparticles with sulfonamide lithium functionality.

Applications - Polymer electrolyte composites, printable gels, binders.



TUNEABLE CHARACTERISTICS

- Size range 30 – 50 or 50 – 100 nm
- Polymer core of Poly(methyl methacrylate) (PMMA) or polystyrene (PS)
- Variable composition of Lithium sulfonamide co-monomer

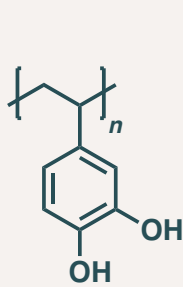
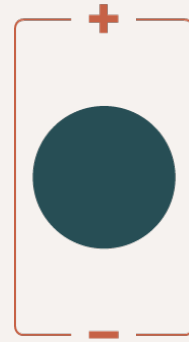


REDOX POLYMERS

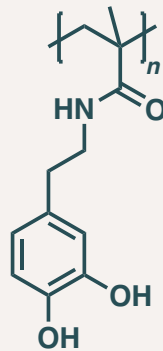
High voltage poly(catechol) polymers.

Radical monomers & polymers bearing TEMPO units.

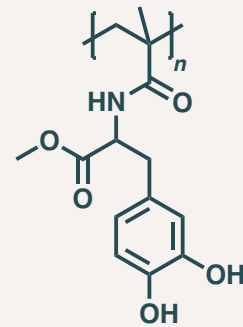
Applications: Organic electrodes, redox-active binders and redox flow batteries, biocompatible coatings.



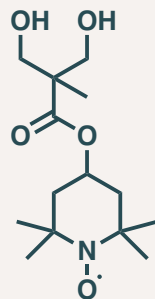
EK03 01



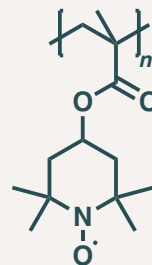
EK03 02-01



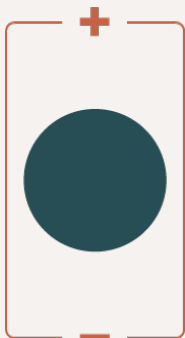
EK03 02-02



EK03 03-01



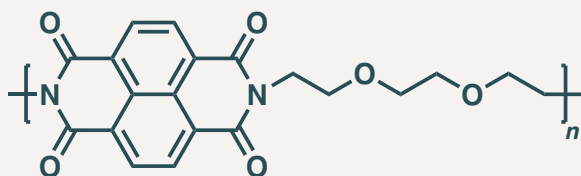
EK03 03-03



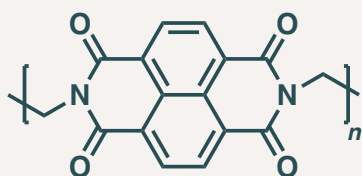
REDOX POLYMERS & MONOMERS

Stable redox monomers & polymers including poly(anthraquinoyl sulphide) or naphthalenic poly(imides).

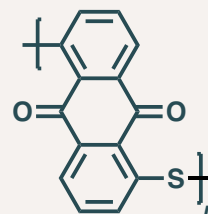
Applications: Organic electrodes, redox-active binders and redox flow batteries.



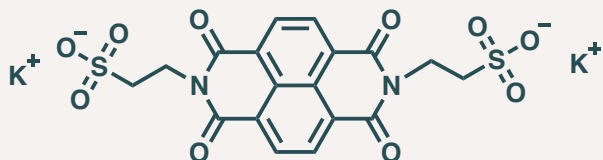
EK03 04



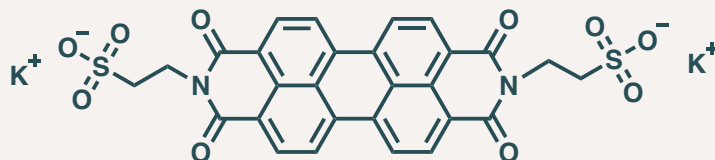
EK03 05



EK03 06



EK03 07-01

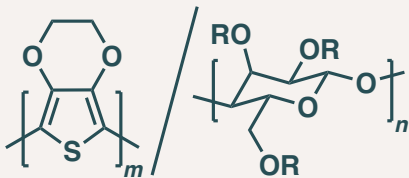
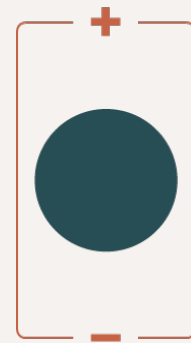


EK03 07-02

PEDOT/BIOPOLYMER dispersions

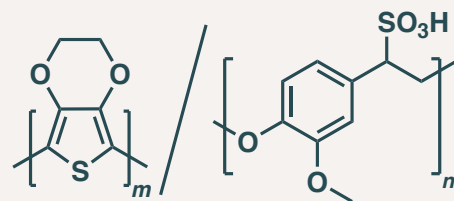
Aqueous dispersions of conducting polymers based on PEDOT and water-soluble biopolymers.

Applications: Conductive additive and water-soluble binders.



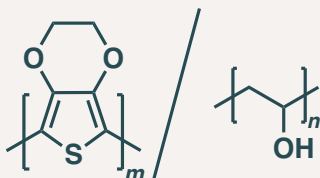
PEDOT/Carboxymethyl cellulose

EK04 01



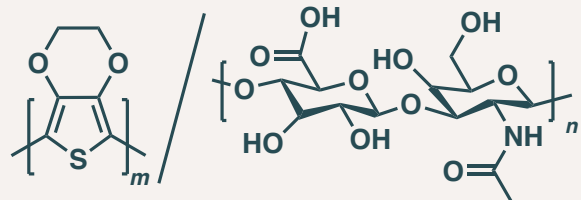
PEDOT/Lignin sulfonate

EK04 02



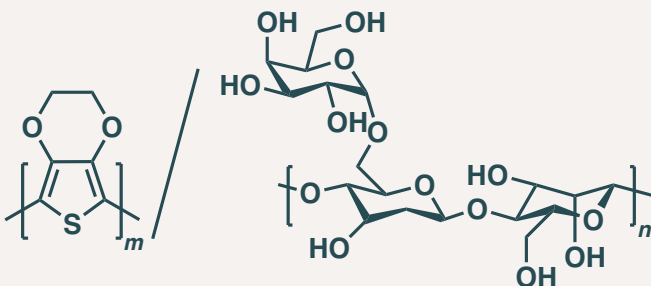
PEDOT/Polyvinyl alcohol

EK04 03



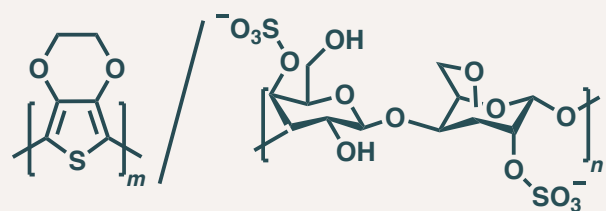
PEDOT/Hyaluronic acid

EK04 04



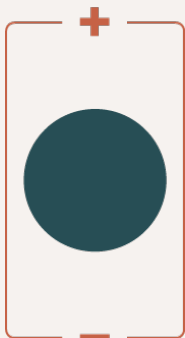
PEDOT/Guar gum

EK04 05



PEDOT/Carrageenan

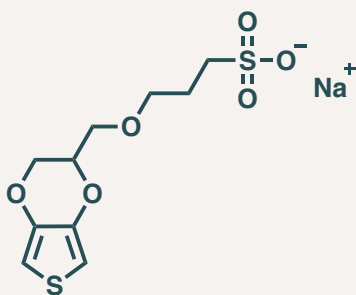
EK04 06



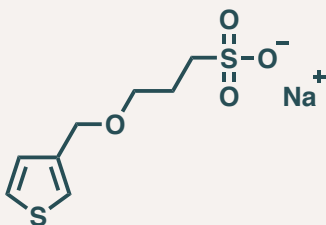
THIOPHENE-BASED MATERIALS

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

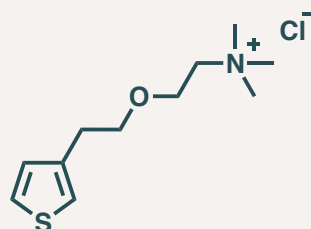
Applications: electronic conductive materials for (bio)electronics.



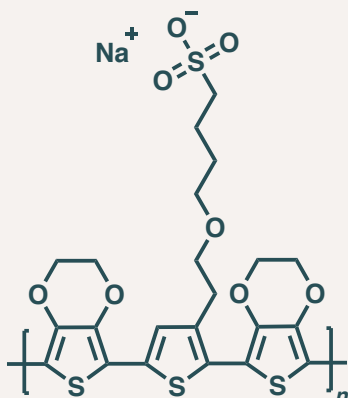
EK05 01-01



EK05 02-01



EK05 02-02



EK05 03-01

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
- ...



On-demand products

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



Tailored polymers & monomers

Biobased polymers, polymers for batteries & bioelectronic devices or functional polymers.

Molecules from recycling

Specific carbonates, ureas, aromatics or oligomers from polymer wastes.

Electronic materials

Poly(ionic liquids), materials for binders, EDOT derivatives and redox polymers.

Contact us



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+34 943 281 920



info@polykey.eu



www.polykey.eu



Provider of
Innovative Polymer
Chemistry Solutions
for a Sustainable
Future