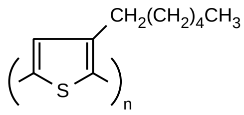
Conducting Polymers and Monomer Precursors

Conducting polymers are finding increased use because they are lightweight, easy to process, and have good mechanical properties. Potential applications include field-effect transistors, capacitor coatings, battery electrodes, light-emitting diodes, nonlinear optical materials, molecular wires, and molecular switches.[1-3]

Aldrich has a wide variety of these materials in stock, and we will gladly custom synthesize monomers and polymers to meet your research and manufacturing needs. Please call **800-771-6737**, extension **5299**, for more information.

Polythiophenes

The conductivity of poly-(3-substituted thiophenes) increases with the degree of regioregularity.[4-6] Aldrich offers these new polymer products with almost complete regioregular head-to-tail structures.



44,570-3

44,570-3 Poly(3-hexylthiophene), regioregular **1g**

44,571-1 Poly(3-octylthiophene), regioregular **1g**

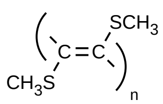
45,065-0 Poly(3-dodecylthiophene), regioregular **1g**

Polyaniline

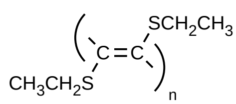
The conductivity of polyaniline sensors and separation membranes[7] is dependent upon polymer chain conformation.[8]

42,832-9 Polyaniline (Emeraldine salt) **5g; 25g**

Polyacetylenes



44,600-9



44,601-7

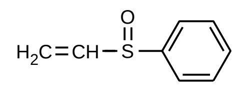
These materials undergo laser-induced permanent electrical conductivity.[9]

44,600-9 Poly[bis(methylthio)acetylene], $\overline{M}_n$ *ca.* 4,000 **50mg; 250mg**

44,601-7 Poly[bis(ethylthio)acetylene], $\overline{M}_n$ ca. 1,200 **50mg; 250mg**

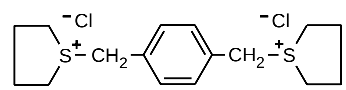
Polyacetylene Precursor

Polymerization of this phenyl vinyl sulfone and subsequent elimination of benzene sulfonic acid gives polyacetylene,[10] a polymer with high conductivity and third-order, nonlinear optical activity.



21,330-6 Phenyl vinyl sulfoxide, 97% **5g ; 25g**

Poly(phenylenevinylene) Precursor

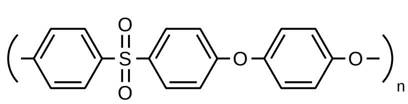


This *p*-xylylene derivative can be thermally converted into the conducting, insoluble, intractable poly(*p*-phenylene-vinylene).[11-13]

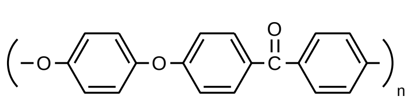
37,708-2 *p*-Xylylenebis(tetrahydrothiophenium chloride), tech., 90% **5g; 25g**

References: (1) Saunders, H.E.; Schoch, K.F., Jr. *Machine Design* **1992**, 161. (2) Brédas, J.L. et al. *Polym. Prepr.* **1994**, *35*, 185. (3) Spangler, C.W. *ibid.* **1994**, *35*, 192. (4) Chen, T.-A. et al. *J. Am. Chem. Soc.* **1995**, *117*, 233. (5) Blohm, M.L. et al. *Macromolecules* **1993**, *26*, 2704. (6) McCullough, R.D. et al. *J. Org. Chem.* **1993**, *58*, 904. (7) Conklin, J.A. et al. *Macromolecules* **1995**, *28*, 6522. (8) Zheng, W.; MacDiarmid, A.G. *Polymer Prepr.* **1995**, *36*, 73. (9) Roth, H.-K. et al. *Synth. Met.* **1990**, *37*, 151. (10) Bader, A.; Wünsch, J. *Macromolecules* **1995**, *28*, 3794. (11) Lenz, R.W. et al. *J. Polym. Sci., Polym. Chem. Ed.* **1988**, *26*, 3241. (12) Lahti, P.M. et al. *J. Am. Chem. Soc.* **1988**, *110*, 7258. (13) Schlenoff, J.A.; Wang, L.-J. *Polym. Prepr.* **1994**, *35*, 238.

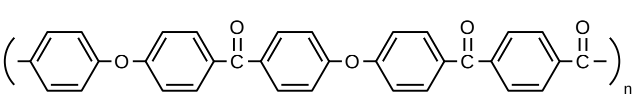
Rigid Backbone Polymers



44,096-5 and **44,097-3**



43,235-0



42,727-6 and **42,728-4**

These linear polymers are rigid at room temperature and have high softening temperatures. They are used in engineering plastics and are capable of replacing metals in many applications.

44,096-5 Poly(1,4-phenylene ether-ether-sulfone), pellets **250g; 1kg**

44,097-3 Poly(1,4-phenylene ether-ether-sulfone), powder **250g; 1kg**

43,235-0 Poly(oxy-1,4-phenyleneoxy-1,4-phenylene-carbonyl-1,4-phenylene) **10g; 50g**

42,727-6 Poly[1,4-benzenedicarbonyl-*alt*-bis(4-phenoxyphenyl)methanone], melt index 200 **25g; 100g**

42,728-4 Poly[1,4-benzenedicarbonyl-*alt*-bis(4-phenoxyphenyl)methanone], melt index 75 **25g; 100g**