Battery Materials
for the 21st Century

What will energy sources of the next century look like? The race is on to answer that question. Research is advancing with hundreds of papers advocating different potential solutions — some entail major departures from the present reliance on lead-acid, nickel-cobalt, or lithium ion batteries; others include only minor improvements; while yet others involve the synthesis of new substances as novel active battery materials.[1] For example:

- **Phosphomolybdic acid as a precursor to hybrid organic-inorganic based molecular batteries with applications as cation-insertion electrodes.**[2]
- **Poly(3-octylthiophene) employed in multilayer polymer film electrodes.**[3]
- **Phosphotungstic acid solution as the electrolyte in a low cost, simple fuel cell, resistant to carbon monoxide poisoning.**[4]

Empower Your Research . . .

We are committed to ensuring your success by continuing to develop and supply the products used in cutting-edge electrochemical research. We are proud to offer the following:

- **Manufacture** of extremely dry, high purity Li salts such as $LiAlCl_4$ in our specialty inorganics production facility.
- **Purification** and **drying** of nonaqueous solvents and custom blending of battery electrolytes to your requirements.
- **Stock on hand** for thousands of products, ready for immediate shipment.
- **Technical assistance** from our experienced, highly qualified staff.
- **Ready access** via our Website: www.sigma-aldrich.com or e-mail: aldrich@sial.com.

See the reverse side for just a small selection of the products currently available from Aldrich. Check out our on-line catalog for the latest additions — search by name fragment, molecular formula, structure, and more! Or e-mail us with your new product suggestions. Your input is welcome at any time. ***"Please Bother Us!"***

(1) Kawai, H. et al. *Chem. Mater.* **1998**, *10*, 3266. (2) Lira-Cantú, M.; Gómez-Romero, P.; *Chem. Mater.* **1998**, *10*, 698. (3) Kvarnstrom, C. et al. *Mater. Res. Soc. Symp. Proc.* **1997**, 451. (4) Hocevar, S. et al. *New Mater. Fuel Cell Mod. Battery Syst. II, Proc. Int. Symp., 2nd,* **1997**, 297.

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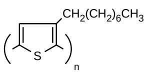
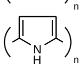
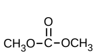
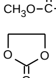
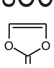
P.O. Box 355, Milwaukee, WI 53201 USA **Telephone:** 414-273-3850 • 800-558-9160 **Fax:** 414-273-4979 • 800-962-9591 **Web Site:** www.sigma-aldrich.com

Quality Materials for Research

Co_3O_4	20,311-4	Cobalt(II,III) oxide, 99.995%	5g, 25g
MnO_2	20,375-0	Manganese(IV) oxide, 99.99%	5g, 25g
MoS_2	23,484-2	Molybdenum(IV) sulfide, powder, <2 µm, 99%	100g, 500g
NiO	20,388-2	Nickel(II) oxide, 99.99%	20g, 100g
$NiO_x \cdot xH_2O$	36,719-2	Nickel peroxide hydrate	10g, 50g
$H_3PO_4 \cdot 12MoO_3 \cdot xH_2O$	43,140-0	Phosphomolybdic acid hydrate, *ReagentPlus*™, 99.99+%	10g, 50g
$H_3PO_4 \cdot 12WO_3 \cdot xH_2O$	45,597-0	Phosphotungstic acid hydrate, 99.995%	10g, 50g
	44,571-1	Poly(3-octylthiophene-2,5-diyl), regioregular	1g
	48,255-2	Polypyrrole, 5 wt. % solution in water	100mL
$H_4[Si_4(W_3O_9)_4] \cdot xH_2O$	38,334-1	Silicotungstic acid hydrate, 99.9+%	10g, 50g
SnO	24,464-3	Tin(II) oxide, powder, 10 µm, 99+%	100g, 500g
WO_3	20,478-1	Tungsten(VI) oxide, 99.995%	50g, 250g
V_2O_3	46,374-4	Vanadium(III) oxide, 99.99%	5g, 25g
V_2O_5	20,485-4	Vanadium(V) oxide, 99.99%	5g, 25g
ZrO_2/Y_2O_3	46,420-1	Zirconium(IV) oxide, yttria stabilized (~5.3% Y_2O_3), submicron powder, 99.5%	100g, 500g
$Li[N(CF_3SO_2)_2]$	44,950-4	N-Lithiotrifluoromethanesulfonimide, 97%	10g, 50g
$LiCoO_2$	44,270-4	Lithium cobalt(III) oxide, 99.8%	25g, 100g
$LiPF_6$	45,022-7	Lithium hexafluorophosphate, 99.99+%	5g, 25g
$LiMn_2O_4$	48,227-7	Lithium manganese(III,IV) oxide, electrochemical grade	25g, 100g
$LiClO_4$	43,156-7	Lithium perchlorate, *ReagentPlus*™, 99.99%	50g, 250g
$LiAlCl_4$	42,947-3	Lithium tetrachloroaluminate, anhydrous, powder, 99.99%	1g, 10g

	D15,292-7	Dimethyl carbonate, 99%	100g, 500g
	E2,625-8	Ethylene carbonate, 98%	100g, 500g
SO_2	29,569-8	Sulfur dioxide, 99.9+%	454g
$SOCl_2$	44,728-5	Thionyl chloride, low iron, 99.5%, (Fe <5ppm)	100mL, 1L
	V260-7	Vinylene carbonate, 97%	5g, 25g

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