**PEGylation Reagents for:**
- Polymerizable Vesicles
- Anti-Biofouling
- Polymer Synthesis

**PEGylation of Biomolecules:**
- Improves Water Solubility
- Increases Biostability
- Reduces Renal Filtration
For further information consult our web site at: www.gelest.com

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Sales of all products listed are subject to the published terms and conditions of Gelest, Inc.

Commercial Status - produced on a regular basis for inventory

Developmental Status - available to support development and commercialization

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# Reactive Polyethers

## TABLE OF CONTENTS

What are Heterobifunctional PEGylation Reagents? ........................................... 2

### Unsaturated and Polymerizable PEGs

- Allyl, Amine Terminated
- Allyl, Amine Terminated, Silylated
- Allyl, Carboxylate Ester Terminated ......................................................... 3
- Allyl, Hydroxyl Terminated ................................................................. 4
- Allyl, Hydroxyl Terminated, TMS Protected
- Methacrylate, Hydroxyl Terminated, TMS Protected
- Allyl, Methyl Terminated ................................................................. 5
- Diallyl Terminated
- Styryl, Amine Terminated
- Amine, Hydroxyl Terminated ......................................................... 6

### PEGylated Silanes

- Tipped PEG Silanes ........................................................................ 7
- Embedded PEG Silanes
- Dipodal PEG Silanes
- Fluorinated PEG Silane ..................................................................... 9
- Functional PEG Silanes
- PEGylated Silicones (Trisiloxanes) .................................................... 10

### Related Products

- Silacrowns ...................................................................................... 11
- Glycol Oligomers ........................................................................... 12
PEGylation Reagents available from Gelest

Gelest is introducing a unique range of PEG reagents with dual functionality that enable new approaches to PEGylation for bioconjugates, reduction of surface biofouling and the formation of polymerizeable vesicles for drug transport. These “first of a kind” materials are heterobifunctional materials with an amine at one terminus and at the other terminus a choice of two different species, one which can undergo radical reactions and one that can undergo hydrolytic condensation. In addition to reacting directly with appropriate functionality of drug or protein substrates, these materials have the potential to undergo polymerization.

PEGylation, the formation of a conjugate of a protein, peptide, drug or other bioactive material by linking it with one or more poly(ethylene glycol) chains, in many instances imparts desirable properties to a biomolecule: increased solubility, resistance to metabolic degradation and reduced immunogenicity. The combination of amine and polymerizeable functionality on a PEG provides new options for bioconjugate formation. Depending on the application, the conjugation can be at either terminus, leaving the remaining terminus to polymerize or act as a pH responsive endgroup. If the unsaturation is utilized as the conjugation point, the amine can undergo ionic interaction, hydrogen bonding or covalent bond formation with other species. The amine functional PEGs also create a pathway to pH responsive behavior.

The new polymerizeable PEG materials have the potential to form polymerizeable vesicles, stabilizing PEGylated drugs or act as comonomers for microencapsulated drug delivery. The polymerization can proceed by either free radical organic polymerization or hydrolysis-condensation siloxane polymerization.

Related PEG products included in this brochure include a broad range of discrete allyl terminated PEGs and Silacrown, analogs of crown ethers.

The front cover motif depicts PEGylation of a bioactive substance and the benefits of the PEGylation with a PEG terminated by styryl and amine functionality as well as potential pathways for both stabilized vesicle formation by polymerization and pH responsive release of the bioactive.

Exemplary reactions for heterobifunctional PEG polymerization by radical and hydrolytic mechanisms are shown below.
### Unsaturated and Polymerizeable PEGs

#### Allyl, Amine Terminated

**ENE0485**
3-(2-AMINOETHOXYPOLY(ETHYLENEOXY)PROPENE (4-7 EO)

- **Name:** Allyl, Amine Terminated
- **MW:** 200-400
- **bp °C/mm:** 1.03 $^{25}$
- **D$_{4}^{20}$:** 1.462 $^{25}$
- **Viscosity:** 15-20 cSt
- **Flashpoint:** >110°C (>230°F)
- **HMIS:** 2-1-0-X
- **n$_{D}^{20}$:** 1.0g $480.00$

**ENE0487**
3-(2-AMINOETHOXYPOLY(ETHYLENEOXY)PROPENE (8-12 EO)

- **Name:** Allyl, Amine Terminated, Silylated
- **MW:** 400-600
- **bp °C/mm:** 1.071 $^{25}$
- **D$_{4}^{20}$:** 1.4660 $^{25}$
- **Viscosity:** 50 cSt
- **Flashpoint:** >110°C (>230°F)
- **HMIS:** 1-1-0-X
- **n$_{D}^{20}$:** 1.0g $480.00$

#### Allyl, Carboxylate Ester Terminated

**ENE0285**
ALLYLOXY(POLYETHYLENE OXIDE), ACETATE (6-9 EO)

- **Name:** Allyl, Carboxylate Ester Terminated
- **MW:** ~450
- **bp °C/mm:** 1.078
- **D$_{4}^{20}$:** 1.458
- **Viscosity:** 30-35 cSt
- **Flashpoint:** >110°C (>230°F)
- **HMIS:** 2-1-0-X
- **n$_{D}^{20}$:** 25g $60.00$

**ENE0287**
ALLYLOXY(POLYETHYLENE OXIDE), DODECANOATE (1-6 EO)

- **Name:** Commercial
- **MW:** 400-600
- **bp °C/mm:** 0.942
- **D$_{4}^{20}$:** 1.454
- **Straw to amber liquid**
- **Flashpoint:** >110°C (>230°F)
- **TSCA:**
- **HMIS:** 2-1-0-X
- **n$_{D}^{20}$:** 100g $320.00$

**ENE0300**
ALLYLOXY(POLYETHYLENE OXIDE), DODECANOATE (2-4 EO)

- **Name:** Commercial
- **MW:** 350-400
- **bp °C/mm:** 0.96 $^{25}$
- **D$_{4}^{20}$:** 1.447 $^{25}$
- **Forms micelles**
- **Flashpoint:** >110°C (>230°F)
- **TSCA:**
- **HMIS:** 2-1-0-X
- **n$_{D}^{20}$:** 10g $340.00$
<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>D&lt;sub&gt;4&lt;/sub&gt;&lt;sup&gt;20&lt;/sup&gt;</th>
<th>n&lt;sub&gt;0&lt;/sub&gt;&lt;sup&gt;20&lt;/sup&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allyl, Hydroxyl Terminated</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENEA0200 2-ALLYLOXYETHANOL</td>
<td>102.13</td>
<td>159&lt;sup&gt;°&lt;/sup&gt;</td>
<td>0.955</td>
<td>1.436</td>
<td></td>
</tr>
<tr>
<td>C&lt;sub&gt;4&lt;/sub&gt;H&lt;sub&gt;9&lt;/sub&gt;O&lt;sub&gt;2&lt;/sub&gt;</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Flashpoint: 66°C (151°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOXICITY: oral rat, LD50: 3,050 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>[111-45-5] TSCA</td>
<td>1kg</td>
<td>$64.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENEA0170 ALLYLOXY(DIETHYLENE OXIDE), 95%</td>
<td>146.18</td>
<td>90° / 4</td>
<td>1.012</td>
<td>1.444</td>
<td>100g</td>
</tr>
<tr>
<td>2-[2-(Allyloxy)ethoxy]etherethanol</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C&lt;sub&gt;11&lt;/sub&gt;H&lt;sub&gt;22&lt;/sub&gt;O&lt;sub&gt;4&lt;/sub&gt;</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Viscosity: 4.7 cSt</td>
<td></td>
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<td></td>
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<tr>
<td>Flashpoint: 102°C (216°F)</td>
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</tr>
<tr>
<td>[15075-50-0] HMIS: 3-2-0-X</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ENEA0385 ALLYLOXY(TRIETHYLENE OXIDE), tech-95</td>
<td>190.24</td>
<td>115-8° / 2</td>
<td>1.026</td>
<td>1.4530</td>
<td>25g</td>
</tr>
<tr>
<td>2-[2-(Allyloxy)ethoxy]etherethanol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C&lt;sub&gt;11&lt;/sub&gt;H&lt;sub&gt;24&lt;/sub&gt;O&lt;sub&gt;4&lt;/sub&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flashpoint: &gt;110°C (&gt;230°F)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>[26150-05-0] HMIS: 2-2-0-X</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ENEA0254 ALLYLOXY(POLYETHYLENE OXIDE) (4-7 EO)</td>
<td>~250</td>
<td></td>
<td>1.059</td>
<td>1.458</td>
<td>25g</td>
</tr>
<tr>
<td>~250 1.059 1.458 Flashpoint: &gt;110°C (&gt;230°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[27274-31-3] TSCA</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ENEA0260 ALLYLOXY(POLYETHYLENE OXIDE) (8-12 EO)</td>
<td>~480</td>
<td></td>
<td>1.089 1.465</td>
<td></td>
<td>25g</td>
</tr>
<tr>
<td>~480 1.089 1.465 Flashpoint: &gt;110°C (&gt;230°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[27274-31-3] TSCA HMIS: 2-1-0-X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENEA0261 ALLYLOXY(POLYETHYLENE OXIDE) (12-20 EO)</td>
<td>~750</td>
<td></td>
<td>1.1</td>
<td></td>
<td>25g</td>
</tr>
<tr>
<td>~750 1.1 Flashpoint: &gt;110°C (&gt;230°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[27274-31-3] TSCA</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ENEA0264 ALLYLOXY(POLYETHYLENE OXIDE) (35-50 EO)</td>
<td>1,500-2,000</td>
<td></td>
<td>1.1</td>
<td></td>
<td>25g</td>
</tr>
<tr>
<td>1,500-2,000 1.1 Flashpoint: &gt;110°C (&gt;230°F)</td>
<td></td>
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<td></td>
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<tr>
<td>[27274-31-3] TSCA</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
### Allyl, Hydroxyl Terminated, TMS Protected

**SIA0479.0**  
O-ALLYLOXY(POLYETHYLENEOXY)TRIMETHYLSILANE, tech-95  
470-560  
Viscosity: 20 - 25 cSt  
Average of 10 -(OCH₂CH₂)- units  
Hydrophilic monomer  
HMIS: 2-3-1-X  
25g $36.00

**SIM6485.9**  
O-METHACRYLOXY(POLYETHYLENEOXY)TRIMETHYLSILANE, 95%  
335-425  
C₆H₅O₃Si, C₇H₆O₃Si, C₈H₇O₃Si  
HMIS: 2-3-1-X  
store <5°C  
100g $96.00

### Allyl, Methyl Terminated

**ENEA0180**  
ALLYLOXY(DIETHYLENE OXIDE), METHYL ETHER, 95%  
C₆H₉O₃  
160.21  
[13752-97-1]  
TSCA  
25g $96.00

**ENEA0360**  
ALLYLOXY(POLYETHYLENE OXIDE), METHYL ETHER (6-8 EO)  
mPEG-allyl  
~350  
>205°  
1.03  
1.452  
Flashpoint: 119°C (246°F)  
[27252-80-8]  
TSCA  
25g $142.00

**ENEA0365**  
ALLYLOXY(POLYETHYLENE OXIDE), METHYL ETHER (10-15 EO)  
~550  
>205°  
1.04  
1.457  
Flashpoint: 136°C (277°F)  
[27252-80-8]  
TSCA  
25g $142.00

**ENEA0366**  
ALLYLOXY(POLYETHYLENE OXIDE), METHYL ETHER (20-55 EO)  
~1,000  
1.05  
[27252-80-8]  
TSCA  
HMIS: 2-1-0-X  
25g $196.00

**ENEA0367**  
ALLYLOXY(TETRAETHYLENE OXIDE), METHYL ETHER, tech-90  
C₇H₉O₃  
248.32  
[96220-75-6]  
1.003  
25g $148.00

**ENEA0375**  
ALLYLOXY(TRIETHYLENE OXIDE), METHYL ETHER, 95%  
2,5,8,11-Tetraoxatetradec-13-ene  
C₇H₉O₃L  
204.26  
75-85°  
0.957  
Flashpoint: 80°C (176°F)  
[19685-21-3]  
HMIS: 2-2-0-X  
25g $124.00

(215) 547-1015  www.gelest.com  info@gelest.com
<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>D₄²⁰</th>
<th>nₒ²⁰</th>
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</thead>
<tbody>
<tr>
<td>ENEM2050</td>
<td>228.36</td>
<td>100° / 4</td>
<td>0.854</td>
<td>10g $320.00</td>
</tr>
</tbody>
</table>

### Diallyl Terminated

**ENE3050**
**POLY(ETHYLENE OXIDE) Diallyl Ether (10-25 EO)**

- Viscosity: 25-30 cSt
- Flashpoint: >110°C (>230°F)
- TSCA: HMIS: 2-1-0-X
- 10g $320.00

### Styryl, Amine Terminated

**ENES4057**
**STYRYLMETHOXY(POLYETHYLENE OXIDE), AMINOETHYLTERMINATED (8-12 EO)**

- Viscosity: 175-225 cSt
- Flashpoint: >110°C (>230°F)
- HMIS: 2-1-0-X, store <5°C
- 0.5g $540.00

### Amine, Hydroxyl Terminated

**PEG0-AH05**
**POLY(ETHYLENE OXIDE), AMINOETHYL, HYDROXYLTERMINATED (4-6 EO)**

- Viscosity: 150-200 cSt
- Flashpoint: >110°C (>230°F)
- HMIS: 2-1-0-X, store <5°C
- 1.0g $440.00

**PEG0-AH11**
**POLY(ETHYLENE OXIDE), AMINOETHYL, HYDROXYLTERMINATED (8-12 EO)**

- Viscosity: 450-550 cSt
- Flashpoint: >110°C (>230°F)
- HMIS: 2-1-0-X, store <5°C
- 1.0g $440.00
## PEGylated Silanes

### Tipped PEG Silanes

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>D&lt;sub&gt;4&lt;/sub&gt;&lt;sup&gt;20&lt;/sup&gt;</th>
<th>n&lt;sub&gt;0&lt;/sub&gt;&lt;sup&gt;20&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIH6188.0</td>
<td>[HYDROXY(POLYETHYLENEOXY)PROPYL]-TRIETHOXYSILANE, (8-12 EO), 50% in ethanol</td>
<td>575-750</td>
<td>0.889</td>
<td>1.401</td>
</tr>
</tbody>
</table>

Flashpoint: 15°C (59°F)
HMIS: 2.4-1-X

### SIM6491.5

11-(2-METHOXYETHOXY)UNDECYLTRICHLOROSILANE

C<sub>11</sub>H<sub>23</sub>ClO<sub>3</sub>Si 363.83 152-3° / 0.3 1.07

Forms self-assembled monolayers with "hydrophilic tips"

[943349-49-3] HMIS: 3-2-1-X

5g $82.00

### SIM6491.7

11-(2-METHOXYETHOXY)UNDECYLTRIMETHOXYSILANE

C<sub>11</sub>H<sub>25</sub>O<sub>3</sub>Si 350.57 152-3° / 0.3 0.947

Flashpoint: >110°C (>230°F)

[1384163-86-3] HMIS: 3-2-1-X

5g $116.00

### SIM6492.56

O-[METHOXYPOLY(ETHYLENE OXIDE)]-N-TRIETHOXYSILYL-PROPYL)CARBAMATE (15-20 EO)

Methoxy-PEG-silane

800-1,200 1.1

Employed in PEGylation of surfaces to reduce biofouling


10g $124.00

### SIM6492.57

2-[METHOXYPOLY(ETHYLENOXY)6-9PROPYL]-DIMETHYLCHLOROSILANE, tech-90

CH<sub>3</sub>O(CH<sub>2</sub>CH<sub>2</sub>O)<sub>6-9</sub>(CH<sub>2</sub>)<sub>2</sub>SiClHMIS: 3-2-1-X

10g $92.00

### SIM6492.58

2-[METHOXYPOLY(ETHYLENOXY)6-9PROPYL]-DIMETHYLMETHOXYSILANE, tech-90

CH<sub>3</sub>O(CH<sub>2</sub>CH<sub>2</sub>O)<sub>6-9</sub>(CH<sub>2</sub>)<sub>2</sub>Si(OCH<sub>3</sub>)HMIS: 2-2-1-X

Flashpoint: >65°C (>150°F)

1.01 1.444

5g $110.00

### SIM6492.66

2-[METHOXY(POLYETHYLENOXY)6-9PROPYL]-TRICHLOROSILANE, tech-90

CH<sub>3</sub>O(CH<sub>2</sub>CH<sub>2</sub>O)<sub>6-9</sub>(CH<sub>2</sub>)<sub>2</sub>ClSiHMIS: 3-2-1-X

90% oligomers

Forms hydrophilic surfaces

[36493-41-1] TSCA

10g $76.00
<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM6492.7</td>
<td>2-[METHOXY(POLYETHYLENEOXY)6-9PROPYL]-TRIMETHOXY SILANE, tech-90</td>
<td>CH$_3$(C$_2$H$<em>4$O)$</em>{6-9}$(CH$_3$)$_3$Si(OCH$_3$)$_3$</td>
<td>1.076</td>
<td>1.403</td>
</tr>
<tr>
<td></td>
<td>Viscosity: 29 cSt</td>
<td>Flashpoint: 88°C (190°F)</td>
<td>Reduces non-specific binding of proteins</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[65994-07-2]</td>
<td>TSCA</td>
<td>HMIS: 2-2-1-X</td>
<td>25g $76.00$</td>
</tr>
<tr>
<td>SIM6492.72</td>
<td>2-[METHOXY(POLYETHYLENEOXY)9-12PROPYL]-TRIMETHOXY SILANE, tech-90</td>
<td>CH$_3$(C$_2$H$<em>4$O)$</em>{9-12}$(CH$_3$)$_3$Si(OCH$_3$)$_3$</td>
<td>1.071</td>
<td>1.451 $^{25}$</td>
</tr>
<tr>
<td></td>
<td>Flashpoint: 88°C (190°F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[65994-07-2]</td>
<td>TSCA</td>
<td>HMIS: 2-2-1-X</td>
<td>25g $76.00$</td>
</tr>
<tr>
<td>SIM6492.73</td>
<td>2-[METHOXY(POLYETHYLENEOXY)21-24PROPYL]-TRIMETHOXY SILANE, tech-90</td>
<td>CH$_3$(C$_2$H$<em>4$O)$</em>{21-24}$(CH$_3$)$_3$Si(OCH$_3$)$_3$</td>
<td>1.120-1.250</td>
<td>1.0g $84.00$</td>
</tr>
<tr>
<td></td>
<td>For MOCVD of hydrophilic films</td>
<td>HMIS: 3-2-1-X</td>
<td></td>
<td>10g $124.00$</td>
</tr>
<tr>
<td>SIM6493.7</td>
<td>METHOXYTRI(ETHYLENEOXY)PROPYLHEXAMETHYL-TRISILOXANYLETHYLTRIETHOXY SILANE, tech-95</td>
<td>C$_9$H$_3$O$_6$Si$_4$</td>
<td>603.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduces protein adsorption on modified substrates</td>
<td>HMIS: 2-1-1-X</td>
<td></td>
<td>10g $86.00$</td>
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<tr>
<td>SIM6493.4</td>
<td>METHOXYTRI(ETHYLENEOXY)PROPYLTRIMETHOXY SILANE</td>
<td>C$_8$H$_3$O$_6$Si</td>
<td>326.46</td>
<td>140° / 0.2</td>
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<tr>
<td></td>
<td>[132388-45-5]</td>
<td>TSCA-L</td>
<td>HMIS: 3-2-1-X</td>
<td>10g $128.00$</td>
</tr>
<tr>
<td>SIM6493.7</td>
<td>METHOXYTRI(ETHYLENEOXY)UNDECYLTRIMETHOXY SILANE</td>
<td>PEG3C11 Silane, 3,3-Dimethoxy-2,15,18,21,24-pentaoxa-3-silapentacosane</td>
<td>C$_9$H$_3$O$_6$Si</td>
<td>438.68</td>
</tr>
<tr>
<td></td>
<td>[1858242-37-1]</td>
<td>HMIS: 3-2-1-X</td>
<td></td>
<td>1.0g $84.00$</td>
</tr>
<tr>
<td>SIM6493.9</td>
<td>METHOXYTRI(ETHYLENEOXY)(11-TRIETHOXYSILYL)-UNDECANOATE, tech-95</td>
<td>C$<em>{11}$H$</em>{23}$O$_6$Si</td>
<td>494.73</td>
<td>0.952</td>
</tr>
<tr>
<td></td>
<td>Hydrophilic-tipped silane</td>
<td>HMIS: 2-1-0-X</td>
<td></td>
<td>2.5g $186.00$</td>
</tr>
</tbody>
</table>
### Embedded PEG Silanes

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
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<tr>
<td>SIT8186.3</td>
<td>536.82</td>
<td>0.977</td>
<td>1.4479</td>
<td></td>
</tr>
<tr>
<td>TRIETHOXYSLYLPROPOXY(POLYETHYLENEOXY)-DODECANOATE, tech-95</td>
<td></td>
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</tr>
<tr>
<td>C$<em>{20}$H$</em>{40}$O$_5$Si</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provides embedded hydrophilicity with oleophilic compatibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[1041420-54-5]</td>
<td>TSCA-L</td>
<td>HMIS: 2-1-1-X</td>
<td>25g $48.00</td>
<td></td>
</tr>
<tr>
<td>SID4472.0</td>
<td>391.88</td>
<td>165° / 0.7</td>
<td>1.028</td>
<td>1.4523</td>
</tr>
<tr>
<td>4,7-DIOXOAODECYLTRICHLOROSILANE, 95%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C$<em>{17}$H$</em>{35}$Cl$_2$O$_7$Si</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forms C$_{18}$ bonded phases with embedded hydrophilicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HMIS: 3-1-1-X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIB1543.0</td>
<td>500.70</td>
<td>1.060</td>
<td>1.4158</td>
<td></td>
</tr>
<tr>
<td>BIS[METHOXY(TRIETHYLENEOXY)PROP]DIMETHOXYSilane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C$<em>{12}$H$</em>{25}$O$_7$Si</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HMIS: 3-2-1-X</td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td></td>
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</tbody>
</table>

### Dipodal PEG Silanes

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIB1824.81</td>
<td>700-1,000</td>
<td>1.085</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N,N'-BIS-[(3-TRIOETHOXYSLYLPROP)AMINOCARBONYL]-POLYETHYLENE OXIDE (7-10 EO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dipodal hydrophilic silane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[178884-91-8]</td>
<td>TSCA</td>
<td>HMIS: 1-1-1-X</td>
<td>25g $24.00</td>
<td></td>
</tr>
<tr>
<td>SIB1824.82</td>
<td>1,000 - 1,200</td>
<td>1.088</td>
<td>1.4583</td>
<td></td>
</tr>
<tr>
<td>N,N'-BIS-[(3-TRIOETHOXYSLYLPROP)AMINOCARBONYL]POLYETHYL Ureasil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity: 300-350 cSt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dipodal hydrophilic silane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antifog coatings can be formed from combinations of polyalkylene oxide functional silanes and film-forming hydrophilic silanes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[178884-91-8]</td>
<td>TSCA</td>
<td>HMIS: 1-1-1-X</td>
<td>25g $56.00</td>
<td></td>
</tr>
<tr>
<td>SIB1824.84</td>
<td>1,400 - 1,600</td>
<td>1.24</td>
<td>1.397</td>
<td></td>
</tr>
<tr>
<td>BIS(3-TRIOETHOXYSLYLPROP)POLYETHYLENE OXIDE (25-30 EO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrolytically stable hydrophilic silane</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>[666829-33-0]</td>
<td></td>
<td>HMIS: 2-1-1-X</td>
<td>25g $84.00</td>
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</table>

### Fluorinated PEG Silanes

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIT8171.2</td>
<td>775-910</td>
<td>1.24</td>
<td>1.397</td>
<td></td>
</tr>
<tr>
<td>(TRIDECACFLUORO-1,1,2,2-TETRAHYDROOCTYL)-(METHOXYPOLY-(ETHYLENEOXY)PROP]DIMETHOXYSilane (6-9 EO), tech-95</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[1936462-94-0]</td>
<td></td>
<td>HMIS: 2-1-0-X</td>
<td>0.5g $520.00</td>
<td></td>
</tr>
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</table>
**Functional PEG Silanes**

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIA0078.0</td>
<td>500 - 700</td>
<td>1.071</td>
<td>1.4527</td>
<td></td>
</tr>
<tr>
<td>2-[(ACETOXYPOLYETHYLENEOXY)PROPYL]TRIETHOXYSiLANE, 95%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity: 50 cSt</td>
<td>HMIS: 2-1-1-X</td>
<td>25g $78.00</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIA0766.0</td>
<td>[2079045-60-4]</td>
<td></td>
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</tr>
<tr>
<td>AZIDOETHYLPOLY(ETHYLENEOXY)PROPYLTRIETHOXYSiLANE (16-20 EO)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>0.5g $480.00</td>
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</table>

**PEGylated Silicones (Trisiloxanes)**

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
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</thead>
<tbody>
<tr>
<td>SIM6492.6</td>
<td>559-691</td>
<td>1.007</td>
<td>1.4416</td>
<td></td>
</tr>
<tr>
<td>2-[(METHOXYPOLYETHYLENEOXY)6-9PROPYL]-HEPTAMETHYLTRISiLOXANE, tech-90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH$_3$(CH$<em>2$O)$</em>{1-6}$(CH$_2$)$_3$(OSi(CH$_3$)$_3$Si</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity: 22 cSt</td>
<td>Flashpoint: 116°C (241°F)</td>
<td>“Super-wetter” Surface tension of 0.1% aqueous solution: 21-22 mN/m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[27306-78-1]</td>
<td>TSCA</td>
<td>HMIS: 2-1-0-X</td>
<td>100g $19.00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIH6185.0</td>
<td>550-650</td>
<td>1.02</td>
<td>1.4463$^{25}$</td>
<td></td>
</tr>
<tr>
<td>3-[HYDROXYPOLYETHYLENEOXY]PROPYL]-HEPTAMETHYLTRISiLOXANE, 90%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HO(CH$<em>2$O)$</em>{1-6}$(CH$_2$)$_3$(OSi(CH$_3$)$_3$Si</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity: 35 cSt</td>
<td>Flashpoint: 118°C (244°F)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>[67674-67-3]</td>
<td>TSCA</td>
<td>HMIS: 1-1-0-X</td>
<td>25g $19.00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>bp °C/mm</th>
<th>$D_4^{20}$</th>
<th>$n_0^{20}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIA0075.0</td>
<td>600-750</td>
<td>1.032</td>
<td>1.4461</td>
<td></td>
</tr>
<tr>
<td>3-2-[ACETOXYPOLYETHYLENEOXY]PROPYL]-HEPTAMETHYLTRISiLOXANE, tech-95</td>
<td></td>
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</tr>
<tr>
<td>Viscosity: 30 cSt</td>
<td>Flashpoint: 79°C (174°F)</td>
<td>Surfactant</td>
<td>TOXICITY: oral rat, LD$50$: &gt;2,000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>[125997-17-3]</td>
<td>TSCA</td>
<td>HMIS: 2-1-0-X</td>
<td>25g $22.00</td>
<td></td>
</tr>
</tbody>
</table>
### Related Products

**Silacrowns**

**SID4220.4**
**DIMETHYLSILICA-11-CROWN-4, 95%**
1,1-Dimethyl-3,6,9,11-tetraoxa-1-silacycloundecane  
\[ C_7H_8O_7Si \] 206.31  96° / 9  1.07  1.4487  
Flashpoint: 77°C (171°F)  
[18339-94-1]  HMIS: 3-2-0-X  
25g $52.00

**SID4220.5**
**DIMETHYLSILICA-14-CROWN-5, 95%**
2,2-Dimethyl-3,6,9,12-pentaoxa-2-silacyclotetradecane  
\[ C_9H_{18}O_{15}Si \] 250.37  125-9° / 0.5  1.08  1.4522  
Potential Li ion electrolyte  
Flashpoint: >110°C (>230°F)  
TOXICITY: oral rat, LD50: 9,900 mg/kg  
[70851-49-9]  TSCA  HMIS: 2-1-0-X  
25g $55.00

**SID4220.6**
**DIMETHYLSILICA-17-CROWN-6, 90%**
\[ C_{10}H_{22}O_{21}Si \] 294.42  168-70° / 0.3  1.09  1.457  
Contains other homologs  
Flashpoint: >110°C (>230°F)  
[83890-22-6]  TSCA  HMIS: 2-1-0-X  
10g $52.00

**SID4220.7**
**DIMETHYLSILICA-20-CROWN-7, 90%**
\[ C_{11}H_{26}O_{25}Si \] 338.47  274-7° / 1  1.092  
Contains other homologs  
Ionophore selective for K⁺ ions  
Inhibits ion mobility in electrical resins  
Flashpoint: >110°C (>230°F)  
[83890-23-7]  HMIS: 2-1-0-X  
5g $69.00

**SID4221.0**
**DIMETHYLSILACROWNS, mixed**
\[ C_7H_8O_7Si \] 250-338  125-295° / 0.3  1.09  
Contains: 70-75% dimethysila-17-crown-6, 10-20% dimethysila-14-crown-5, 10-20% dimethysila-20-crown-7  
Low cost phase transfer catalyst  
Flashpoint: >110°C (>230°F)  
25g $36.00
## Glycol Oligomers

<table>
<thead>
<tr>
<th>Name</th>
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<th>D$_4^{20}$</th>
<th>n$_0^{20}$</th>
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</thead>
<tbody>
<tr>
<td>PEG0-HH06</td>
<td>282.33</td>
<td>200-202° / 2</td>
<td>1.127</td>
<td>1.464</td>
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<tr>
<td>HEXAETHYLENEGLYCOL</td>
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</tr>
<tr>
<td>3,6,9,12,15-Pentaoxaheptadecane-1,17-diol</td>
<td>C$<em>{20}$H$</em>{38}$O$_{7}$</td>
<td>HMIS: 3-2-1-X</td>
<td>25g $180.00</td>
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<tr>
<td>PEG0-HH07</td>
<td>326.38</td>
<td>244° / 0.6</td>
<td>1.14</td>
<td>1.457</td>
</tr>
<tr>
<td>HEPTAETHYLENEGLYCOL</td>
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</tr>
<tr>
<td>3,6,9,12,15,18-Hexaoxaoicosane-1,20-diol</td>
<td>C$<em>{21}$H$</em>{40}$O$_{8}$</td>
<td>HMIS: 3-1-1-X</td>
<td>10g $190.00</td>
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<tr>
<td>ENEP3810</td>
<td>~1,500</td>
<td>0.99</td>
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<tr>
<td>POLY(PROPYLENE OXIDE) MONOALLYL ETHER (20-30 PO)</td>
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</tr>
<tr>
<td></td>
<td>Viscosity: 150-200 cSt</td>
<td>Flashpoint: 264°C(507°F)</td>
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</tr>
<tr>
<td></td>
<td>TSCA</td>
<td>HMIS: 1-1-0-X</td>
<td>100g $280.00</td>
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</tr>
<tr>
<td>SIB1660.0</td>
<td>600-800</td>
<td>1.00</td>
<td>1.452$^{25}$</td>
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</tr>
<tr>
<td>BIS[(3-METHYLDIMETHOXYSILYL)PROPYL]POLYPROPYLENE OXIDE</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Viscosity: 6,000-10,000 cSt</td>
<td>Flashpoint: &gt;110°C (&gt;230°F)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>With tin catalyst forms moisture-cross-linkable resins; hydrophilic dipodal silane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TSCA</td>
<td>HMIS: 3-1-1-X</td>
<td>100g $19.00</td>
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</tbody>
</table>
Metal-Organics for Material & Polymer Technology
The latest Gelest handbook provides many new compounds with applications on optical, microelectronic, diagnostic and materials applications. Highly referenced listings and device applications are presented.

Silicon Compounds: Silanes and Silicones
Detailed chemical properties and reference articles for compounds. The Handbook of silane and silicone chemistry includes scholarly reviews as well as detailed information on various applications.

Reactive Silicones: Forging New Polymer Links
The brochure describes reactive silicones that can be formulated into coatings, membranes, cured rubbers and adhesives for mechanical, optical, electronic and ceramic applications. Information on reactions and cures of silicones as well as physical properties shortens product development time for chemists and engineers.

Silicone Fluids - Stable, Inert Media
Design and Engineering properties for conventional silicone fluids as well as thermal, fluorosilicone, hydrophilic and low temperature grades are presented in selection guide. The brochure provides data on thermal, rheological, electrical, mechanical and optical properties for silicones. Silicone fluids are available in viscosities ranging from 0.65 to 2,500,000 cSt.

Silicon-Based Blocking Agents
These silicon reagents are used for functional group protection, synthesis and derivatization. The 52 page brochure presents detailed application information on silylation reagents for pharmaceutical synthesis and analysis. Detailed descriptions are presented on selectivity for reactions, resistance to chemical transformations and selective de-blocking conditions. Over 1200 references are provided.

Silane Coupling Agents
Silane coupling agents enhance adhesion, increase mechanical properties of composites, improve dispersion of pigments and fillers and immobilize catalysts and biomaterials. This brochure describes chemistry, techniques, applications and physical properties of silane coupling agents.