

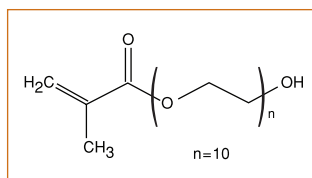


Hydrophilic Monomers for Research Applications

Introduction of hydrophilic properties into polymers is required in applications where higher water and oxygen transmission rates are desirable without sacrificing basic mechanical or physical properties of the polymer backbone. This property balancing act is particularly critical in end uses such as optical lenses, membranes, biomedical devices (e.g. topical dermal patches), breathable coatings and other high value-added applications.

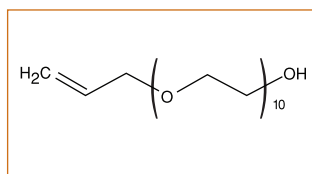
Hydroxyl Functional Monomers

(HEMA-10) Poly Ethoxy (10) ethyl methacrylate (CAS # 25736-86-1)



This homolog of HEMA bears 10 ethoxy units on the ester linkage. These water soluble pendant, non-ionic side chains not only increase water compatibility in the polymer but can enhance stabilization of latex systems alone or in combination with added non-ionic surfactants.

Hydroxypolyethoxy (10) Allyl Ether (CAS # 27274-31-3)



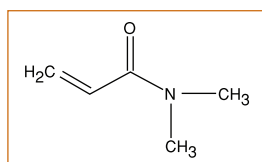
Where ester groups are undesirable due to hydrolytic conditions, allyl ethers may be useful in vinyl polymerizations through the allylic olefin to impart hydrophilic properties in aqueous solution or emulsion polymers.

These higher homologs are extensions of the Polysciences, Inc. hydroxyethyl methacrylate-HEMA (Cat. # 04675) currently available as a high purity optical monomer.

Physical Property Profiles of HEMA methacrylates

| | (HEMA 10) Poly Ethoxy (10) ethyl methacrylate | Hydroxypolyethoxy (10) Allyl Ether |
|---------------------------------|--|---------------------------------------|
| Molecular Weight | 526 | 498 |
| Ethylene oxide, moles | 10 | 10 |
| Active content (%) | 90 | 99 |
| Moisture content (%) | 0.5 | 0.2 |
| Hydroxyl number (mg KOH/mg) | 98 | 115 |
| Inhibitor (p-benzophenone; ppm) | 800 | --- |
| Appearance | Viscous Liquid | Low Viscosity Liquid |

N, N-Dimethylacrylamide, 99.9% (CAS # 2680-03-7)

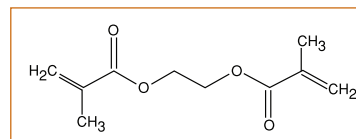


Amido functional monomers increase hydrophilic properties and copolymerize well into a range of acrylate and methacrylate systems. This exceptionally high purity monomer is ideal for research in optical lens applications.

Physical Property Profile of N, N-Dimethylacrylamide

| | |
|-----------------------|--------------|
| Molecular Weight | 99 |
| Purity (%) | 99.9 |
| Water (%) | 0.1 |
| Inhibitor (MEHQ, ppm) | 50 |
| Appearance | Clear Liquid |

Ethylene Glycol Dimethacrylate, 99.7% (CAS # 97-90-5)



Where crosslinking of acrylate or methacrylate polymers is required to achieve a porous network structure, ethylene glycol dimethacrylate may be used as a high purity crosslinker with bridging/spacing capability between polymer chains.

Physical Property Profile of Ethylene Glycol Dimethacrylate

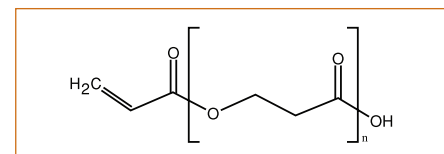
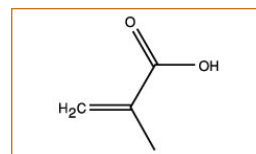
| | |
|-------------------------------------|---------------------------|
| Molecular Weight: 198 | Moisture (%): 0.03 |
| Purity (%): 99.7 | Inhibitor (MEHQ, ppm): 50 |
| 2-hydroxyethylmethacrylate (%): 0.3 | Appearance: Clear Liquid |

Acid Functional Monomers

Methacrylic Acid, 99.9% (CAS # 79-41-4)

Beta-Carboxyethyl Acrylate, 99% (CAS # 24615-84-7)

High purity carboxylated monomers increase the hydrophilicity in polymers and provide crosslinking sites for divalent ions (e.g. Zn⁺⁺). Polysciences, Inc. offers both methacrylic acid in high purity (99.9%) and a longer chain analog, Beta-Carboxyethyl acrylate (99%).



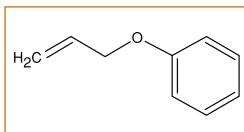
Physical Property Profiles of Acid Functional Monomers

| | Methacrylic Acid | Beta-Carboxyethyl Acrylate |
|-----------------------|------------------|----------------------------|
| CAS # | 79-41-4 | 24615-84-7 |
| Molecular Weight | 86 | 144 |
| Purity (%) | 99.9 | 99 |
| Moisture (%) | 0.05 | 0.70 |
| Inhibitor (MEHQ, ppm) | 200 | 1,000 |
| Appearance | Clear Liquid | Slightly Viscous Liquid |

Physical Property Profile of 2-Cyanoethyl Acrylate

| | |
|---------------------------|---------------------------------|
| Molecular weight: 125 | Moisture (%): 0.2 |
| Active Monomer (%): 92 | Inhibitor (HQ, ppm): 700 |
| Acid Value (meq/gm): 0.03 | Appearance: Light Yellow Liquid |

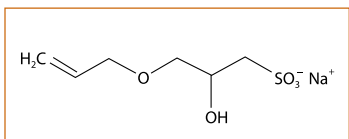
Allyl Phenyl Ether, 98% (CAS # 1746-13-0)



High purity monomer which has a high refractive index allowing it to be used as a synthon in modifying polymer refractive index properties.

Sulfonated Monomer

Sodium 1-Allyloxy-2 hydroxypropyl Sulfonate (CAS # 52556-42-0)



Sodium salt of the allyl ether sulfonate. It readily undergoes vinyl polymerization reactions in aqueous or emulsion systems and provides a bound source of anionically charged sulfonate groups in a polymer backbone.

Anionic charge assists in latex particle stabilization in low surfactant systems but also aids in downstream formulation work to avoid the addition of high levels of excess surfactants for formulation stabilization. This improves water resistance in formulations and provides low foaming properties.

Physical Property Profile of Sodium 1-Allyloxy-2-hydroxypropyl Sulfonate

| | |
|------------------------------------|------------------------|
| Molecular Weight: 218 | Water (%): 60 |
| Active Polymer (% in aq. sol.): 40 | pH (10% in water): 7.5 |

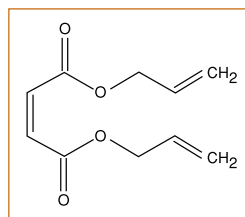
Physical Property Profile of Allyl Phenyl Ether

| | |
|------------------------|-------------------------------|
| Molecular Weight: 134 | Specific gravity (20°C): 0.97 |
| Purity (%): 98 | Refractive Index (20°C): 1.52 |
| Boiling Point (C): 185 | Appearance: Amber Liquid |

| Description | CAS # | Cat. # | Size |
|--|------------|--------|------|
| (HEMA 10) PolyEthoxy (10) ethyl methacrylate | 25736-86-1 | 24890 | 100g |
| Hydroxypolyethoxy(10) Allyl Ether | 27274-31-3 | 24899 | 100g |
| Ethylene Glycol Dimethacrylate, 99.7% | 97-90-5 | 24896 | 250g |
| N, N-Dimethylacrylamide | 2680-03-7 | 02255 | 100g |
| Methacrylic Acid, 99.9% | 79-41-4 | 24897 | 250g |
| Beta-Carboxyethyl Acrylate, 99% | 24615-84-7 | 24891 | 100g |
| Sodium 1-Allyloxy-2 hydroxypropyl Sulfonate | 52556-42-0 | 24898 | 100g |
| Diallyl Maleate | 99-21-3 | 24892 | 100g |
| 2-Cyanoethyl Acrylate | 106-71-8 | 01829 | 100g |
| Allyl Phenyl Ether, 98% | 1746-13-0 | 24894 | 100g |

Other Specialty Monomers

Diallyl Maleate (CAS # 99-21-3)



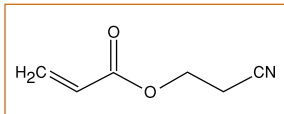
Diallyl ester of maleic acid. Once polymerized through the vinyl center adjacent to the ester groups, it provides multiple post-functionalization target sites at the pendant allylic centers. This makes it particularly useful both in acrylic chemistry but also in combination with alkyd and polyester resins.

When employed at very low levels it is an effective site for branching generation in emulsion polymers.

Physical Property Profile of Diallyl Maleate

| | |
|-----------------------------|--------------------------|
| Molecular Weight: 196 | Moisture (%): 0.05 |
| Active Monomer (%): 99 | Appearance: Clear Liquid |
| Acidity value (meq/gm): 0.1 | |

2-Cyanoethyl Acrylate (CAS # 106-71-8)



Used in a wide range of applications including photocurable resists for liquid crystal devices, photocurable polymer insulators for multilayer circuitry,

electroluminescent products, graft polymers for controlled diffusion, vulcanization of rubbers and as an adhesion promoter. It is not to be confused with the alpha-cyano ethyl acrylate which is used in some Super Glue® products.