Polymers incorporating hydroxymethyl acrylamide or hydroxymethyl methacrylamide: Human health tier II assessment

12 December 2019

Chemicals in this assessment

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, 2-methyl-, 2-ethylhexyl ester, polymer with N-(hydroxymethyl)-2-propenamide	25213-58-5
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	59822-58-1
2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	25035-74-9
2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide, 2-methyl-2-propenamide and 2-propenenitrile	25068-04-6
2-Propenoic acid, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-methyl-2-propenamide	25085-40-9
2-Propenamide, N-(hydroxymethyl)-2-methyl-, polymer with 1,3-butadiene and 2-propenenitrile	25135-82-4

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, 2-methyl-, 1,2-ethanediyl ester, polymer with 2-ethylhexyl 2-methyl-2-propenoate and N-(hydroxymethyl)-2-propenamide	25322-90-1
2-Propenoic acid, polymer with ethenylbenzene, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	25585-70-0
2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and methyl 2-methyl-2-propenoate	25639-14-9
2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	25639-28-5
2-Propenoic acid, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	25852-42-0
Acetic acid, ethenyl ester, polymer with ethene and N-(hydroxymethyl)-2-propenamide	25951-70-6
2-Propenoic acid, 2-ethylhexyl ester, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	26139-82-2
Acetic acid , ethenyl ester, polymer with N-(hydroxymethyl)-2-propenamide	26337-27-9
2-Propenoic acid, butyl ester, polymer with ethenyl acetate and N-(hydroxymethyl)-2-propenamide	26428-41-1
2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide	26428-44-4
2-Propenamide, N-(hydroxymethyl)-, polymer with 1,3-butadiene and ethenylbenzene	26591-53-7
2-Propenamide, N-(hydroxymethyl)-, polymer with 1,3-butadiene and 2-propenenitrile	26603-98-5
2-Propenoic acid, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	26604-01-3

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide, 2-propenamide and 2-propenenitrile	27082-48-0
2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-propenamide	27157-48-8
2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	27235-04-7
Acrylic acid, polymer with butyl acrylate, N-(hydroxymethyl)-2-methylacrylamide and styrene	27288-65-9
2-Propenoic acid, butyl ester, polymer with chloroethene, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile	27288-68-2
2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide and 2-propenamide	28433-25-2
Acrylic acid, polymer with acrylonitrile, butyl acrylate and N-(hydroxymethyl)-2-methylacrylamide	28928-66-7
2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	29013-35-2
2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile	29434-28-4
2-Propenoic acid, butyl ester, polymer with ethenyl benzeneand N-(hydroxymethyl)-2-methyl-2-propenamide	30209-96-2
2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenamide	30394-81-1
2-Propenoic acid, 2-methyl-, polymer with 1,3-butadiene, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	30555-45-4
2-Propenoic acid, polymer with 1,3-butadiene, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	30555-49-8

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	30586-88-0
Acrylic acid, 2-ethylhexyl ester, polymer with acrylonitrile and N-(hydroxymethyl)-2-methylacrylamide	30586-93-7
2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenamide	30662-48-7
2-Propenoic acid, ethyl ester, polymer with ethenylbenzene,N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	30662-95-4
2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and methyl 2-methyl-2-propenoate	30943-44-3
2-Propenoic acid, 2-methyl-, butyl ester, polymer with butyl 2-propenoate and N-(hydroxymethyl)-2-methyl-2-propenamide	31135-91-8
2-Propenoic acid, ethyl ester, polymer with ethenyl acetate and N-(hydroxymethyl)-2-propenamide	32875-87-9
2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	33438-19-6
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and methyl 2-methyl-2-propenoate	33482-02-9
2-Propenoic acid, 2-methyl-, 1,2-ethanediyl ester, polymer with butyl 2-propenoate, 2-hydroxyethyl 2-methyl-2-propenoate, N-(hydroxymethyl)-2-propenamide, 2-propenenitrile and 2-propenoic acid	34365-01-0
2-Propenoic acid, polymer with butyl 2-propenoate, ethenyl acetate and N-(hydroxymethyl)-2-propenamide	36582-38-4
2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenamide	37130-03-3

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	38054-57-8
2-Propenoic acid, ethyl ester, polymer with 1,1-dichloroethene and N-(hydroxymethyl)-2-propenamide	38294-73-4
2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with butyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	38812-47-4
2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenamide	40893-50-3
2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	42208-55-9
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, methyl 2-methyl-2-propenoate and 2-propenenitrile	51807-22-8
2-Propenoic acid, polymer with 2-ethylhexyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	52640-81-0
2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and methyl 2-methyl-2-propenoate	52640-90-1
2-Propenoic acid, 2-methyl-, polymer with N-(hydroxymethyl)-2-propenamide, methyl 2-methyl-2-propenoate, methyl 2-propenoate and 2-propenenitrile	55738-43-7
2-Propenoic acid, polymer with butyl 2-propenoate, ethenylbenzene, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	56507-08-5
2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenoic acid	57216-22-5
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethenyl acetate and N-(hydroxymethyl)-2-propenamide	57216-57-6

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethenyl acetate, ethenylbenzene and N-(hydroxymethyl)-2-propenamide	57216-59-8
2-Propenoic acid, ethyl ester, polymer with 1,1-dichloroethene and N-(hydroxymethyl)-2-methyl-2-propenamide	57418-28-7
2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile	57447-94-6
Acetic acid, ethenyl ester, copolymer with chloroethene, ethene and N-(hydroxymethyl)-2-propenamide	57546-92-6
2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	57673-13-9
2-Propenoic acid, 2-methyl,- polymer with butyl 2-propenoate, N-(2-hydroxymethyl)-2-methyl-2-propenamide, methyl 2-methyl-2-propenoate and 2-methyl-2-propenamide	57981-97-2
2-Propenoic acid, butyl ester, polymer with ethyl2-propenoate, N-(hydroxymethyl)-2-propenamide, 2-propenamide and 2-propenenitrile	61467-52-5
Butanedioic acid, methylene-, polymer with ethenylbenzene, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	61644-67-5
2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenamide	63149-91-7
Butanedioic acid, methylene-, polymer with butyl 2-propenoate, 2-ethylhexyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	63929-27-1
Butanedioic acid, methylene-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenamide	65292-36-6
Butanedioic acid, methylene-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	66028-16-8

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and methyl 2-methyl-2-propenoate	69383-11-5
2-Propenoic acid, polymer with ethenyl acetate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	66991-43-3
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	67785-43-7
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	67785-51-7
2-Propenoic acid, 2-methyl-, polymer with ethenyl acetate, 2-ethylhexyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	68555-48-6
2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, ethenyl acetate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenoic acid	68555-49-7
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-methylpropyl 2-propenoate	68555-50-0
2-Propenoic acid, polymer with ethenyl acetate, 2-ethylhexyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	68555-52-2
2-Propenoic acid, butyl ester, polymer with 1,1-dichloroethene and N-(hydroxymethyl)-2-propenamide	68874-46-4
2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, oxiranylmethyl 2-propenoate and 2-propenenitrile	68929-19-1
2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile	68966-73-4

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, polymer with butyl 2-propenoate, ethenylbenzene, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenamide	71477-85-5
2-Propenoic acid, butyl ester, polymer with ethene, ethenylacetate and N-(hydroxymethyl)-2-propenamide	81526-97-8
2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile	102082-98-4
2-Propenoic acid, butyl ester, polymer with ethenylbenzene,N-(hydroxymethyl)-2-methyl-2-propenamide, methyl 2-propenoate and 2-propenenitrile	102082-99-5
2-Propenoic acid, butyl ester, polymer with ammonium 2-propenoate, ethenylbenzene and N-(hydroxymethyl)-2-methyl-2-propenamide	102561-64-8
2-Propenoic acid, butyl ester, polymer with ethenyl acetate, ethyl 2-propenoate, 2-hydroxyethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	102763-15-5
2-Propenoic acid, polymer with butyl 2-propenoate, 2-ethylhexyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile	102958-45-2
2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethenyl acetate, 2-ethylhexyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	103226-16-0
2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, methyl 2-methyl-2-propenoate and 2-propenenitrile	103226-17-1
2-Propenoic acid, ethyl ester, polymer with ethenyl acetate, N-(hydroxymethyl)-2-propenamide and oxiranylmethyl 2-propenoate	103226-20-6
2-Propenoic acid, 2-methyl-, polymer with butyl 2-methyl-2-propenoate, butyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	103226-21-7

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, butyl ester, polymer with ethenylbenzene,ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	103242-98-4
2-Propenoic acid, 2-methyl-, polymer with ethenylacetate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	103458-34-0
2-Propenoic acid, butyl ester, polymer with ethenyl acetate, ethenylbenzene and N-(hydroxymethyl)-2-propenamide	103671-35-8
2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide, sodium salt	104072-75-5
2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide, ammonium salt	104072-76-6
Butanedioic acid, methylene-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, 2-propenamide, 2-propenenitrile and 2-propenoic acid	104339-59-5
2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide, 2-methyl-2-propenamide and 2-propenenitrile	104835-95-2
2-Propenoic acid, ethyl ester, polymer with ethenyl propanoate and N-(hydroxymethyl)-2-propenamide	106006-90-0
2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, hydroxy[(1-oxo-2-propenyl)amino]acetic acid and 2-propenenitrile	113010-49-4
2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with ethyl 2-propenoate, methyl 2-propenoate and N-(hydroxymethyl)-2-propenamide	116467-99-3
Butanedioic acid, methylene-, polymer with ethenyl acetate,N-(hydroxymethyl)-2-propenamide and methyl 2-propenoate	119948-48-0
2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 3-(trimethoxysilyl)propyl 2-methyl-2-propenoate	124661-40-1

Chemical Name in the Inventory	CAS Number
2-Propenoic acid, 2-methyl-, polymer with 1,2-ethanediylbis(2-methyl-2-propenoate), 2-ethylhexyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile	127104-67-0
Neononanoic acid, ethenyl ester, polymer with ethenyl acetate and N-(hydroxymethyl) 2-propenamide	129851-35-0
2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, octadecyl 2-propenoate and 3-(trimethoxysilyl)propyl 2-methyl-2-propenoate	185529-37-7

Preface

This assessment was carried out by staff of the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) using the Inventory Multi-tiered Assessment and Prioritisation (IMAP) framework.

The IMAP framework addresses the human health and environmental impacts of previously unassessed industrial chemicals listed on the Australian Inventory of Chemical Substances (the Inventory).

The framework was developed with significant input from stakeholders and provides a more rapid, flexible and transparent approach for the assessment of chemicals listed on the Inventory.

Stage One of the implementation of this framework, which lasted four years from 1 July 2012, examined 3000 chemicals meeting characteristics identified by stakeholders as needing priority assessment. This included chemicals for which NICNAS already held exposure information, chemicals identified as a concern or for which regulatory action had been taken overseas, and chemicals detected in international studies analysing chemicals present in babies' umbilical cord blood.

Stage Two of IMAP began in July 2016. We are continuing to assess chemicals on the Inventory, including chemicals identified as a concern for which action has been taken overseas and chemicals that can be rapidly identified and assessed by using Stage One information. We are also continuing to publish information for chemicals on the Inventory that pose a low risk to human health or the environment or both. This work provides efficiencies and enables us to identify higher risk chemicals requiring assessment.

The IMAP framework is a science and risk-based model designed to align the assessment effort with the human health and environmental impacts of chemicals. It has three tiers of assessment, with the assessment effort increasing with each tier. The Tier I assessment is a high throughput approach using tabulated electronic data. The Tier II assessment is an evaluation of risk on a substance-by-substance or chemical category-by-category basis. Tier III assessments are conducted to address specific concerns that could not be resolved during the Tier II assessment.

These assessments are carried out by staff employed by the Australian Government Department of Health and the Australian Government Department of the Environment and Energy. The human health and environment risk assessments are conducted and published separately, using information available at the time, and may be undertaken at different tiers.

This chemical or group of chemicals are being assessed at Tier II because the Tier I assessment indicated that it needed further investigation.

For more detail on this program please visit:**www.nicnas.gov.au**

Disclaimer

ACRONYMS & ABBREVIATIONS

Grouping Rationale

The chemicals covered by this assessment are polymers with monomers that include 2-propenamide, N-(hydroxymethyl (NMA, hydroxymethyl acrylamide) or 2-propenamide, N-(hydroxymethyl)-2-methyl (hydroxymethyl methacrylamide). Both these chemicals can hydrolyse to form formaldehyde (formaldehyde donors). Some polymers in this group may be used in the production of binding agents for paints, adhesives, and in the manufacture of textiles and packaging materials intended to come in contact with food.

These polymers are generally expected to be of low concern to human health. However, the products manufactured using these polymers may contain low levels of hydroxymethyl acrylamide or hydroxymethyl methacrylamide monomers as impurities, and may also release formaldehyde when heated or following hydrolysis. The hazardous properties of released formaldehyde are expected to dominate the toxicity profile of these polymers.

Import, Manufacture and Use

Australian

No specific Australian use, import, or manufacturing information has been identified.

International

The following international uses have been identified through Galleria Chemica; the Substances in Preparations in Nordic Countries (SPIN) database and the United States Environmental Protection Agency (US EPA) Chemical and Product Categories (CPCat) database.

Some polymers in this group have reported domestic uses, including in:

- adhesives and binding agents (CAS No. 25035-74-9, 26337-27-9 and 25951-70-6)
- paints (CAS No. 25035-74-9, 106006-90-0 and 25951-70-6);
- packaging materials intended to come in contact with food – additives (CAS Nos. 26591-53-7, 30394-81-1, 26428-41-1, 63149-91-7, 29434-28-4, 106006-90-0, 28433-25-2, 27082-48-0.

Some polymers in this group have reported industrial uses, including in:

- the manufacture of wood and products of wood and cork, except furniture, manufacture of articles of straw and plaiting materials and synthetic polymers (CAS Nos. 26337-27-9).

Some polymers in this group have reported site-limited uses, including in:

- textile manufacturing (CAS Nos. 30394-81-1, 25639-28-5, 33438-19-6 and 27082-48-0).

Some polymers in this group have reported non-industrial uses, including:

- in the manufacture of pesticide - inert ingredients (CAS Nos.33438-19-6, 29434-28-4, 26604-01-3 and 28433-25-2).

Restrictions

Australian

There are no restrictions specific to the use of these polymers in Australia.

International

No known restrictions specific to these polymers have been identified.

However, the polymers in this group may release formaldehyde from formaldehyde donors, and may be subject to the restrictions on formaldehyde, under certain conditions.

Monomers hydroxymethyl acrylamide or hydroxymethyl methacrylamide present in these polymers are regulated for use as a component of food contact substances under the US FDA - List of Indirect Additives Used in Food Contact Substances (US FDA, 2018) with the following limitation:

- plastic articles intended for single-use food contact: the polymers used in these plastics must not contain more than 5 % w/w of total polymer units derived from the chemical.

The monomers are also regulated for use as a component of food contact substances under the EU – Commission Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food (European Commission, 2011) with the following limitations:

- authorised to be used as monomer or other starting substance but not as an additive or polymer production aid;
- the specific migration limit (SML) 0.05 mg substance per kg of food applies.

These monomers are formaldehyde donors and may produce formaldehyde in use products. Using formaldehyde in cosmetics in the European Union (EU) is subject to the restrictions described in EU Regulation, Annex III (List of substances which cosmetic products must not contain except subject to the restrictions laid down) and Annex V (List of preservatives allowed in cosmetic products) (CosIng).

Existing Worker Health and Safety Controls

Hazard Classification

The polymers are not listed on the Hazardous Chemical Information System (HCIS) (Safe Work Australia).

Exposure Standards

Australian

No specific exposure standards are available.

Safe Work Australia has an exposure standard for formaldehyde. When the polymers in this group contain free formaldehyde or release formaldehyde, exposure standards of 1.2 mg/m^3 (1 part per million) time weighted average (TWA) and 2.5 mg/m^3 (2 parts per million) short term exposure limit (STEL) apply.

International

There are no international exposure standards for the individual polymers in this group.

Health Hazard Information

There are no data available on the health hazards of the polymers in this group. The bioavailability of the polymers is expected to be negligible due to their large molecular size. The monomers, hydroxymethyl acrylamide and hydroxymethyl methacrylamide have acute and repeat dose toxicity (NICNASa; NICNASb). However, the polymers in this group are not expected to readily release significant quantities of these monomers. As a result, no significant health effects are expected from these monomers. However, it is considered that the release of formaldehyde from the decomposition of these polymers will be the critical driver of toxicity. Free formaldehyde is extremely reactive, and its key health hazards are identified in the NICNAS Priority Existing Chemical (PEC) assessment of formaldehyde (NICNAS, 2006).

In humans and experimental animals, formaldehyde is readily absorbed via all exposure routes. The critical health effects of formaldehyde for risk characterisation are sensory irritation and skin sensitisation. At higher exposure levels, formaldehyde is a probable carcinogen (IARC, 2006; NICNAS, 2006).

Formaldehyde causes moderate acute toxicity in animals following exposure via the oral, dermal and inhalation routes. When in solution, formaldehyde produces skin irritation and skin sensitisation. Following inhalational exposure, formaldehyde reacts rapidly at the site of contact and is quickly metabolised in the respiratory tissue. Upon inhalation, humans experience sensory irritation, which is defined as irritation of the nerve endings in the eyes and nose, and can produce symptoms including a sensation of stinging or burning in the eyes, nose and/or throat. The concentration of ambient formaldehyde at which these symptoms are reported to begin to occur is at 0.5 ppm and higher (NICNAS, 2006).

Formaldehyde (in solution) does not produce systemic toxicity following repeated oral or dermal exposures in animals. Repeated inhalational exposures to formaldehyde (as a gas) do not produce systemic toxicity. Studies show that the target organ following formaldehyde exposure is the nasal tract, where effects observed have included dose-dependent alterations in mucociliary clearance, cell proliferation and histopathological changes to the nasal epithelium (NICNAS, 2006).

Formaldehyde has been shown to be genotoxic in vitro. The chemical may also produce genotoxicity at the site of contact in vivo. Overall, the chemical is considered to possess weak genotoxic potential. Formaldehyde has been shown to produce squamous cell carcinomas in inhalational studies in rats, but not in mice and hamsters. Several epidemiological studies demonstrated that occupational exposure to formaldehyde may be associated with an increased risk of nasopharyngeal cancers; however, the data are not consistent. Formaldehyde exposure has also been associated with myeloid leukaemia; however, the available data are insufficient to establish a causal link. Based on the weight of evidence, the International Agency for Research on Cancer has concluded that there is sufficient evidence to classify formaldehyde as a ‘known human carcinogen’ (IARC, 2006).

The polymers may be used in the manufacture of adhesives, wood products and textiles and formaldehyde can be released as a vapour, due to off-gassing from products containing these polymers. Formaldehyde release will be highest in newly manufactured products, and decrease over time. Increased levels of formaldehyde in air can occur if resin is heated to temperatures where it decomposes or when in contact with high humidity levels. Breathing formaldehyde vapour can result in irritation of nerves in the eyes and nose, which may cause burning, stinging or itching sensations, a sore throat, teary eyes, blocked sinuses, runny nose, and sneezing (NICNAS, 2006).

Risk Characterisation

Critical Health Effects

The polymers in this group are not expected to readily release significant quantities of hydroxymethyl acrylamide or hydroxymethyl methacrylamide. As a result, no significant health effects are expected from these monomers. If the polymers in this group do not readily release free formaldehyde, none of the polymers are expected to have significant health effects.

However, where the polymers in this group degrade to free formaldehyde or are capable of releasing formaldehyde, the critical health effects for risk characterisation include sensory irritation and allergic skin reactions.

Sensory irritation is defined as irritation of the nerve endings in the eyes and nose and can produce symptoms such as stinging or burning sensations in the eyes, nose and/or a sore throat. The level of formaldehyde in the air at which these symptoms have been known to start to occur is 0.5 parts per million (ppm). Long term exposure to higher levels of gaseous formaldehyde may lead to certain cancers (NICNAS, 2006).

Public Risk Characterisation

These polymers are generally expected to be of low concern to human health. Although use in consumer products in Australia is not known, the polymers have reported domestic use overseas as components in paints, adhesives, wood products and food packaging material. In these instances, the general public could be exposed to the polymers through dermal or inhalation routes.

The public could come into contact with food contact articles and coated surfaces containing the polymers, although it is expected that the polymers will be bound within the article or coated surface.

The products manufactured using these polymers may contain low levels of free hydroxymethyl acrylamide or hydroxymethyl methcrylamide as impurities due to incomplete polymerisation. However, such low amounts of chemical do not pose a risk to consumers. They may also release formaldehyde (formaldehyde donors) when heated, or following alkaline or acidic hydrolysis of terminal methylol groups (Danish EPA, 2014).

The main potential public exposure to formaldehyde released from these polymers is expected to be via the inhalation of indoor air. The levels of formaldehyde in the air in a home will depend on a number of factors, including the presence of emission sources such as the presence of those products listed above, the age and use patterns of the sources, indoor temperature and humidity, and ventilation of the home. NICNAS has a recommended indoor air guidance value of 80 parts per billion (ppb) for formaldehyde (NICNAS, 2006).

While the risk of health effects from exposure via the products listed above is generally low, individuals already sensitised to formaldehyde can experience skin reactions even at low concentrations. Therefore, caution is advised in the use of formaldehyde-containing products that come into contact with the skin. The SUSMP specifies limits for the levels of formaldehyde in cosmetic and domestic products (SUSMP, 2019). The current controls in Schedule 6 and 10 of the *Standard for the Uniform Scheduling of Medicines and Poisons* (SUSMP) (see **Restrictions — Australian** section) are considered adequate to minimise the risk to public health posed by domestic and cosmetic products containing the polymers. Therefore, the polymers in this group are not considered to pose an unreasonable risk to public health provided the concentrations of the free formaldehyde present in products meet the SUSMP limit.

The Australian Competition and Consumer Commission (ACCC) has published safety guidance information on acceptable concentrations of formaldehyde in clothing, textiles and clothing finishes (ACCC, 2014).

Overall, the risk to the public using products containing these polymers is low, both from breathing formaldehyde vapour and from contact of formaldehyde with the skin. At these formaldehyde levels in public spaces, the carcinogenic risk is very low (NICNAS, 2006).

Occupational Risk Characterisation

Polymers in this group are not imported or used in Australia. During product formulation exposure might occur, particularly where manual or open processes are used. These could include transfer and blending activities, quality control analysis, and cleaning and maintaining equipment. Worker exposure to the chemicals at lower concentrations could also occur while using formulated products containing the chemicals. The level and route of exposure will vary depending on the method of application and work practices employed.

Given the acute and critical systemic long-term effects of monomers that may be present in small amounts as impurities, and local effects of formaldehyde, the polymers in this group could pose an unreasonable risk to workers unless adequate control measures to minimise exposure and implemented. These polymers should be appropriately labelled to ensure that a person

conducting a business or undertaking, e.g. employer, at a workplace, has adequate information to determine appropriate controls.

Workers may be exposed to formaldehyde via inhalation during off-gassing from unsealed or freshly cut pressed wood products, and from the associated dust particles.

Occupational risks from exposure to formaldehyde from these polymers can be mitigated by ensuring effective ventilation when these products are used in indoor environments. Handling and storage of treated products should only be undertaken in well ventilated areas. When machining pressed wood products, the use of local exhaust ventilation which extracts dusts and vapours at source is recommended in controlling exposure to formaldehyde. If symptoms of burning, stinging or itching of the eyes and/or nose, sore throat, watery eyes, blocked sinuses, runny nose or sneezing occurs, the worker is advised to move to an area with fresh air.

NICNAS Recommendation

Current risk management measures are considered adequate to protect public and workers' health and safety, provided that all requirements are met under workplace health and safety, and poisons legislation as adopted by the relevant state or territory. No further assessment is required.

Companies using or marketing these polymers should seek sufficient information to determine whether the polymer contains free formaldehyde or releases formaldehyde, and take appropriate risk management measures to control the hazards stipulated in the HCIS, and the advice and controls in the SUSMP.

It is recommended that occupational and public health controls for the formaldehyde vapours released from these polymers be implemented in line with the recommendations of the NICNAS PEC assessment report on formaldehyde (NICNAS 2006).

Regulatory Control

Public Health

At present, free formaldehyde or formaldehyde released from the products fall within the scope of the listing of 'Formaldehyde' in Schedules 6 and 10 of the SUSMP. Therefore, products containing the polymers in this group with more than 0.05 % free or readily available formaldehyde should be labelled in accordance with state and territory legislation (SUSMP, 2019).

Work Health and Safety

The polymers in this group are not recommended for classification and labelling under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS). Should empirical data become available for the individual polymers indicating that a classification is appropriate, the data may be used to make recommendation for GHS classifications.

The recommendation for GHS classifications does not consider classification of physical hazards and environmental hazards.

From 1 January 2017, under the model Work Health and Safety Regulations, chemicals are no longer to be classified under the Approved Criteria for Classifying Hazardous Substances system.

Advice for consumers

Products containing the polymers in this group should be used according to the instructions on the label.

Advice for industry

Control measures

Control measures to minimise the risk exposure to the polymer in this group containing free formaldehyde or is a formaldehyde donor should be implemented in accordance with the hierarchy of controls. Approaches to minimise risk include substitution, isolation and engineering controls. Measures required to eliminate or minimise risk arising from storing, handling and using a hazardous chemical depend on the physical form and the manner in which the chemical is used. Examples of control measures which may minimise the risk include, but are not limited to:

- using closed systems or isolating operations;
- using local exhaust ventilation to prevent the chemical from entering the breathing zone of any worker;
- health monitoring for any worker who is at risk of exposure to the chemical if valid techniques are available to monitor the effect on the worker's health;
- air monitoring to ensure control measures in place are working effectively and continue to do so;
- minimising manual processes and work tasks through automating processes;
- work procedures that minimise splashes and spills;
- regularly cleaning equipment and work areas; and
- using protective equipment that is designed, constructed, and operated to ensure that the worker does not come into contact with the chemical.

Guidance on managing risks from hazardous chemicals are provided in the *Managing risks of hazardous chemicals in the workplace—Code of practice* available on the Safe Work Australia website.

Obligations under workplace health and safety legislation

Information in this report should be taken into account to help meet obligations under workplace health and safety legislation as adopted by the relevant state or territory. This includes, but is not limited to:

- ensuring that hazardous chemicals are correctly classified and labelled;
- ensuring that (material) safety data sheets ((M)SDS) containing accurate information about the hazards (relating to both health hazards and physicochemical (physical) hazards) of the chemical are prepared; and
- managing risks arising from storing, handling and using a hazardous chemical.

Your work health and safety regulator should be contacted for information on the work health and safety laws in your jurisdiction.

Information on how to prepare an (M)SDS and how to label containers of hazardous chemicals are provided in relevant codes of practice such as the *Preparation of safety data sheets for hazardous chemicals—Code of practice* and *Labelling of workplace hazardous chemicals—Code of practice*, respectively. These codes of practice are available from the Safe Work Australia website.

A review of the physical hazards of the chemical has not been undertaken as part of this assessment.

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Last Update 12 December 2019

Chemical Identities

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, 2-ethylhexyl ester, polymer with N-(hydroxymethyl)-2-propenamide** acrylamide (N-hydroxymethyl), methacrylic acid (2-ethylhexyl ester) polymer

CAS Number	25213-58-5
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C12H22O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** butyl acrylate, N-methylolacrylamide, methacrylic acid polymer
CAS Number	59822-58-1
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** ethyl 2-propenoate, methyl 2-methyl-2-propenoate, N-(hydroxymethyl)-2-propenamide polymer methyl methacrylate, polymer with ethyl acrylate and methylolacrylamide
CAS Number	25035-74-9
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C5H8O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide, 2-methyl-2-propenamide and 2-propenenitrile** acrylonitrile, butyl acrylate, methacrylamide, methylol methacrylamide polymer
CAS Number	25068-04-6
Structural Formula	**No Structural Diagram Available**

Molecular Formula	(C7H12O2.C5H9NO2.C4H7NO.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-methyl-2-propenamide**
CAS Number	25085-40-9
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H9NO2.C5H8O2.C3H4O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenamide, N-(hydroxymethyl)-2-methyl-, polymer with 1,3-butadiene and 2-propenenitrile** acrylamide, N-(hydroxymethyl)-2-methyl-, polymer with acrylonitrile and 1,3-butadiene
CAS Number	25135-82-4
Structural Formula	

	
Molecular Formula	(C5H9NO2.C4H6.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, 1,2-ethanediyl ester, polymer with 2-ethylhexyl 2-methyl-2-propenoate and N-(hydroxymethyl)-2-propenamide** methacrylic acid, 2-ethylhexyl ester, methacrylic acid (ethyl ester), N-hydroxymethyl acrylamide polymer
CAS Number	25322-90-1
Structural Formula	
Molecular Formula	(C12H22O2.C10H14O4.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with ethenylbenzene, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide**

	ethyl 2-propenoate, ethenylbenzene, 2-propenoic acid, N-(hydroxymethyl)-2-propenamide polymer
CAS Number	25585-70-0
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H8.C5H8O2.C4H7NO2.C3H4O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and methyl 2-methyl-2-propenoate** ethyl acrylate, methyl methacrylate, methacrylic acid, N-methylolacrylamide polymer
CAS Number	25639-14-9
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C5H8O2.C4H7NO2.C4H6O2)x

Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** ethyl acrylate, methacrylic acid, N-methylolacrylamide polymer
CAS Number	25639-28-5
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** ethyl 2-propenoate, 2-propenoic acid, N-(hydroxymethyl)-2-propenamide polymer
CAS Number	25852-42-0
Structural Formula	

	
Molecular Formula	(C5H8O2.C4H7NO2.C3H4O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Acetic acid, ethenyl ester, polymer with ethene and N-(hydroxymethyl)-2-propenamide** vinyl acetate, ethylene, N-methylol acrylamide terpolymer
CAS Number	25951-70-6
Structural Formula	
Molecular Formula	(C4H7NO2.C4H6O2.C2H4)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-ethylhexyl ester, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** 2-propenamide, N-(hydroxymethyl)-, polymer with 2-ethylhexyl 2-propenoate and ethyl 2-propenoate

	acrylic acid, 2-ethylhexyl ester, polymer ethyl acrylate and N-(hydroxymethyl)acrylamide ethyl acrylate, 2-ethylhexyl acrylate, N-methylolacrylamide polymer
CAS Number	26139-82-2
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C11H20O2.C5H8O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Acetic acid , ethenyl ester, polymer with N-(hydroxymethyl)-2-propenamide** poly(vinyl acetate, N-methylolacrylamide)
CAS Number	26337-27-9
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethenyl acetate and N-(hydroxymethyl)-2-propenamide** butyl acrylate, N-methylolacrylamide, vinyl acetate polymer butyl acrylate, vinyl acetate, methylolacrylamide polymer ethenyl acetate, polymer with butyl 2-propenoate and N-(hydroxymethyl)-2-propenamide n-butyl acrylate, N-methylolacrylamide, vinyl acetate polymer vinyl acetate, butyl acrylate, N-methylolacrylamide polymer
CAS Number	26428-41-1
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide** ethyl 2-propenoate, N-hydroxymethyl-2-propenamide polymer ethyl acrylate, N-methylolacrylamide polymer
CAS Number	26428-44-4
Structural Formula	**No Structural Diagram Available**

Molecular Formula	(C5H8O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenamide, N-(hydroxymethyl)-, polymer with 1,3-butadiene and ethenylbenzene** styrene, butadiene, N-methylolacrylamide polymer
CAS Number	26591-53-7
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H8.C4H7NO2.C4H6)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenamide, N-(hydroxymethyl)-, polymer with 1,3-butadiene and 2-propenenitrile** 1,3-butadiene, 2-propenenitrile, N-hydroxymethyl-2-propenamide polymer
CAS Number	26603-98-5
Structural Formula	

	
Molecular Formula	(C4H7NO2.C4H6.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** ethyl acrylate, acrylonitrile, acrylic acid, N-methylolacrylamide tetrapolymer
CAS Number	26604-01-3
Structural Formula	
Molecular Formula	(C5H8O2.C4H7NO2.C3H4O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide, 2-propenamide and 2-propenenitrile** ethyl 2-propenoate, 2-propenenitrile, N-(hydroxymethyl)-2-propenamide, 2-propenamide polymer

	ethyl acrylate, acrylonitrile, acrylamide, methylolacrylamide polymer
CAS Number	27082-48-0
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C4H7NO2.C3H5NO.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-propenamide**
CAS Number	27157-48-8
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** methyl methacrylate, butyl acrylate, N-methylolacrylamide polymer
CAS Number	27235-04-7
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Acrylic acid, polymer with butyl acrylate, N-(hydroxymethyl)-2-methylacrylamide and styrene** acrylic acid, butyl acrylate, N-methylolmethacrylamide, styrene copolymer
CAS Number	27288-65-9
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H8.C7H12O2.C5H9NO2.C3H4O2)x

Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with chloroethene, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile** acrylic acid, butyl ester, polymer with acrylonitrile, chloroethylene and N-(hydroxymethyl)-2-methylacrylamide
CAS Number	27288-68-2
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H9NO2.C3H3N.C2H3Cl)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide and 2-propenamide** acrylamide, ethyl acrylate, methylolacrylamide polymer
CAS Number	28433-25-2
Structural Formula	

	
Molecular Formula	(C5H8O2.C4H7NO2.C3H5NO)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Acrylic acid, polymer with acrylonitrile, butyl acrylate and N-(hydroxymethyl)-2-methylacrylamide** 2-propenoic acid, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile
CAS Number	28928-66-7
Structural Formula	
Molecular Formula	(C7H12O2.C5H9NO2.C3H4O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** ethyl 2-propenoate, polymer with 2-propenenitrile and N-(hydroxymethyl)-2-

	propenamide
CAS Number	29013-35-2
Structural Formula	
Molecular Formula	(C5H8O2.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile**
CAS Number	29434-28-4
Structural Formula	
Molecular Formula	(C7H12O2.C5H9NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethenyl benzeneand N-(hydroxymethyl)-2-methyl-2-propenamide**
CAS Number	30209-96-2
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H8.C7H12O2.C5H9NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenamide** ethyl 2-propenoate, methyl 2-methyl-2-propenoate, N-(hydroxymethyl)-2-propenamide, 2-propenamide polymer ethyl acrylate, acrylamide, N-methylolacrylamide, methylmethacrylate polymer
CAS Number	30394-81-1
Structural Formula	**No Structural Diagram Available**

Molecular Formula	(C5H8O2.C5H8O2.C4H7NO2.C3H5NO)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with 1,3-butadiene, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** 1,3-butadiene, 2-propenenitrile, 2-methyl-2-propenoic acid, N-hydroxymethyl-2-propenamide methacrylic acid, polymer with acrylonitrile, 1,3-butadiene and N-(hydroxymethyl)acrylamide
CAS Number	30555-45-4
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C4H7NO2.C4H6O2.C4H6.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with 1,3-butadiene, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** 2-propenamide, N-(hydroxymethyl)-, polymer with 1,3-butadiene, 2-propenenitrile and 2-propenoic acid 2-propenenitrile, polymer with 1,3-butadiene, N-(hydroxymethyl)-2-propenamide and 2-propenoic acid acrylic acid, acrylonitrile, butadiene, N-methylolacrylamide copolymer
CAS Number	30555-49-8
Structural Formula	

	
Molecular Formula	(C4H7NO2.C4H6.C3H4O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** acrylonitrile, butyl acrylate, N-methylol acrylamide copolymer butyl 2-propenoate, 2-propenenitrile, N-(hydroxymethyl)-2-propenamide polymer butyl acrylate, acrylonitrile, N-methylolacrylamide polymer
CAS Number	30586-88-0
Structural Formula	
Molecular Formula	(C7H12O2.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Acrylic acid, 2-ethylhexyl ester, polymer with acrylonitrile and N-(hydroxymethyl)-2-methylacrylamide** 2-ethylhexylacrylate, polymer with acrylonitrile and N-

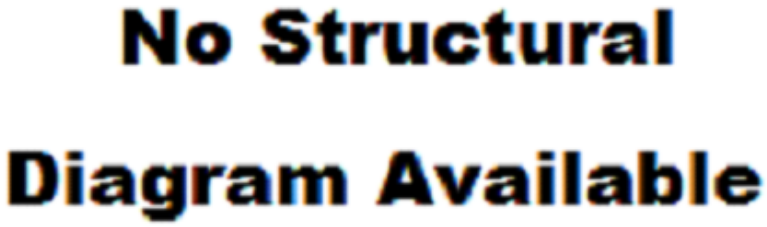
	methylolmethacrylamide
CAS Number	30586-93-7
Structural Formula	
Molecular Formula	(C11H20O2.C5H9NO2.C3H3N)x
Molecular Weight	

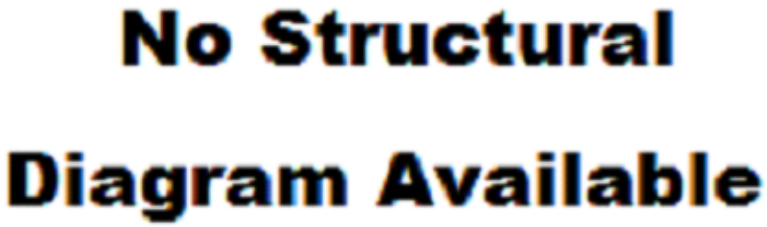
Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenamide** methacrylic acid, methyl ester, polymer with ethyl acrylate, N-(hydroxymethyl)-2-methacrylamide and methacrylamide
CAS Number	30662-48-7
Structural Formula	
Molecular Formula	(C5H9NO2.C5H8O2.C5H8O2.C4H7NO)x

Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with ethenylbenzene,N-(hydroxymethyl)-2-propenamide and 2-propenenitrile**
CAS Number	30662-95-4
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H8.C5H8O2.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and methyl 2-methyl-2-propenoate** 2-propenamide, N-(hydroxymethyl)-2-methyl-, polymer with ethyl 2-propenoate, methyl 2-methyl-2-propenoate and 2-methyl-2-propenoic acid 2-propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenoic acid ethyl acrylate, methacrylic acid, methyl methacrylate, N-methylolmethacrylamide copolymer methacrylic acid, polymer with ethyl acrylate, N-(hydroxymethyl)-2-methylacrylamide and methyl methacrylate
CAS Number	30943-44-3
Structural Formula	

	
Molecular Formula	(C5H9NO2.C5H8O2.C5H8O2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, butyl ester, polymer with butyl 2-propenoate and N-(hydroxymethyl)-2-methyl-2-propenamide**
CAS Number	31135-91-8
Structural Formula	
Molecular Formula	(C8H14O2.C7H12O2.C5H9NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with ethenyl acetate and N-(hydroxymethyl)-2-propenamide** ethenyl acetate, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide

	ethyl acrylate, vinyl acetate, methylolacrylamide polymer
CAS Number	32875-87-9
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** butyl acrylate, N-methylolacrylamide, ethyl acrylate polymer ethyl 2-propenoate, butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide polymer
CAS Number	33438-19-6
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and methyl 2-methyl-2-propenoate** 2-propenamide, N-(hydroxymethyl)-, polymer with butyl 2-propenoate, methyl 2-methyl-2-propenoate and 2-methyl-2-propenoic acid
CAS Number	33482-02-9
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, 1,2-ethanediyl ester, polymer with butyl 2-propenoate, 2-hydroxyethyl 2-methyl-2-propenoate, N-(hydroxymethyl)-2-propenamide, 2-propenenitrile and 2-propenoic acid** 2-propenamide, N-(hydroxymethyl)-, polymer with butyl 2-propenoate, 1,2-ethanediyl bis(2-methyl-2-propenoate), 2-hydroxyethyl 2-methyl-2-propenoate, 2-propenenitrile and 2-propenoic acid 2-propenenitrile, polymer with butyl 2-propenoate, 1,2-ethanediyl bis(2-methyl-2-propenoate), 2-hydroxyethyl 2-methyl-2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenoic acid acrylamide, N-(hydroxymethyl)-, polymer with acrylic acid, acrylonitrile, butyl acrylate, ethylene methacrylate and 2-hydroxyethyl methacrylate acrylonitrile, polymer with acrylic acid, butyl acrylate, ethylene methacrylate, 2-hydroxyethyl methacrylate and N-(hydroxymethyl)acrylamide methacrylic acid, ethylene ester, polymer with acrylic acid, acrylonitrile, butyl acrylate, 2-hydroxyethyl methacrylate and N-(hydroxymethyl)acrylamide
CAS Number	34365-01-0
Structural Formula	

	
Molecular Formula	(C10H14O4.C7H12O2.C6H10O3.C4H7NO2.C3H4O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with butyl 2-propenoate, ethenyl acetate and N-(hydroxymethyl)-2-propenamide** ethenyl acetate, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenoic acid vinyl acetate, butyl acrylate, acrylic acid, N-methylol acrylamide polymer
CAS Number	36582-38-4
Structural Formula	
Molecular Formula	(C7H12O2.C4H7NO2.C4H6O2.C3H4O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenamide** butyl acrylate, methacrylamide, methylolmethacrylamide polymer

CAS Number	37130-03-3
Structural Formula	
Molecular Formula	(C7H12O2.C5H9NO2.C4H7NO)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** butyl acrylate, N-methylolacrylamide, ethyl acrylate, acrylonitrile polymer ethyl acrylate, butyl acrylate, acrylonitrile, N-methylolacrylamide polymer
CAS Number	38054-57-8
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with 1,1-dichloroethene and N-(hydroxymethyl)-2-propenamide** ethyl acrylate, vinylidene chloride, methylolacrylamide polymer
CAS Number	38294-73-4

Structural Formula	
Molecular Formula	(C5H8O2.C4H7NO2.C2H2Cl2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with butyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** butyl acrylate-ethyl acrylate-glycidyl methacrylate-N-methylolacrylamide polymer
CAS Number	38812-47-4
Structural Formula	
Molecular Formula	(C7H12O2.C7H10O3.C5H8O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenamide**

CAS Number	40893-50-3
Structural Formula	
Molecular Formula	(C5H9NO2.C5H8O2.C4H7NO)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** ethyl acrylate, methacrylic acid, acrylonitrile, N-methylolacrylamide polymer
CAS Number	42208-55-9
Structural Formula	
Molecular Formula	(C5H8O2.C4H7NO2.C4H6O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, methyl 2-methyl-2-propenoate and 2-propenenitrile** 2-propenamide, N-(hydroxymethyl)-, polymer with butyl 2-propenoate, ethyl 2-propenoate, methyl 2-methyl-2-propenoate, 2-methyl-2-propenoic acid and 2-propenenitrile butyl acrylate, methyl methacrylate, ethyl acrylate, N-methlolacrylamide, methacrylic acid, acrylonitrile polymer
CAS Number	51807-22-8
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C5H8O2.C4H7NO2.C4H6O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with 2-ethylhexyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** ethyl acrylate, 2-ethylhexyl acrylate, acrylonitrile, acrylic acid, N-methylolacrylamide polymer
CAS Number	52640-81-0
Structural Formula	

	
Molecular Formula	(C11H20O2.C5H8O2.C4H7NO2.C3H4O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and methyl 2-methyl-2-propenoate** 2-propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-methyl-2-propenamide
CAS Number	52640-90-1
Structural Formula	
Molecular Formula	(C5H9NO2.C5H8O2.C5H8O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with N-(hydroxymethyl)-2-propenamide, methyl 2-methyl-2-propenoate, methyl 2-propenoate and 2-propenenitrile**

	2-propenenitrile, polymer with N-(hydroxymethyl)-2-propenamide, methyl 2-methyl-2-propenoate, methyl 2-propenoate and 2-methyl-2-propenoic acid methyl methacrylate, N-methylolacrylamide, methacrylic acid, methyl acrylate, acrylonitrile polymer
CAS Number	55738-43-7
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C4H7NO2.C4H6O2.C4H6O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with butyl 2-propenoate, ethenylbenzene, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** butyl 2-propenoate, ethenylbenzene, 2-propenenitrile, 2-propenoic acid, N-hydroxymethyl-2-propenamide polymer
CAS Number	56507-08-5
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H8.C7H12O2.C4H7NO2.C3H4O2.C3H3N)x

Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenoic acid**
CAS Number	57216-22-5
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H9NO2.C5H8O2.C5H8O2.C3H4O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethenyl acetate and N-(hydroxymethyl)-2-propenamide** butyl acrylate, N-methylolacrylamide, methacrylic acid, vinyl acetate polymer
CAS Number	57216-57-6
Structural Formula	

	
Molecular Formula	(C7H12O2.C4H7NO2.C4H6O2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethenyl acetate, ethenylbenzene and N-(hydroxymethyl)-2-propenamide** 2-propenamide, N-(hydroxymethyl)-, polymer with butyl 2-propenoate, ethenyl acetate, ethenylbenzeneand 2-methyl-2-propenoic acid acetic acid, ethenyl ester, polymer with butyl 2-propenoate, ethenylbenzene, N-(hydroxymethyl)-2-propenamide and 2-methyl-2-propenoic acid
CAS Number	57216-59-8
Structural Formula	
Molecular Formula	(C8H8.C7H12O2.C4H7NO2.C4H6O2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with 1,1-dichloroethene and N-(hydroxymethyl)-2-methyl-2-propenamide**

	ethyl acrylate, N-(hydroxymethyl)methacrylamide, vinylidene chloride polymer
CAS Number	57418-28-7
Structural Formula	No Structural Diagram Available
Molecular Formula	(C5H9NO2.C5H8O2.C2H2Cl2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile**
CAS Number	57447-94-6
Structural Formula	No Structural Diagram Available
Molecular Formula	(C5H9NO2.C5H8O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Acetic acid, ethenyl ester, copolymer with chloroethene, ethene and N-(hydroxymethyl)-2-propenamide** ethene, chloro-, copolymer with ethene, ethenyl acetate and N-(hydroxymethyl)-2-propenamide ethylene, N-methylolacrylamide, vinyl acetate, vinyl chloride copolymer
CAS Number	57546-92-6
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C4H7NO2.C4H6O2.C2H4.C2H3Cl)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile**
CAS Number	57673-13-9
Structural Formula	

	
Molecular Formula	(C5H8O2.C5H8O2.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl,- polymer with butyl 2-propenoate, N-(2-hydroxymethyl)-2-methyl-2-propenamide, methyl 2-methyl-2-propenoate and 2-methyl-2-propenamide**
CAS Number	57981-97-2
Structural Formula	
Molecular Formula	(C7H12O2.C5H9NO2.C5H8O2.C4H7NO.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethyl2-propenoate, N-(hydroxymethyl)-2-propenamide, 2-propenamide and 2-propenenitrile** butyl acrylate, ethyl acrylate, acrylonitrile, N-methylolacrylamide, acrylamide

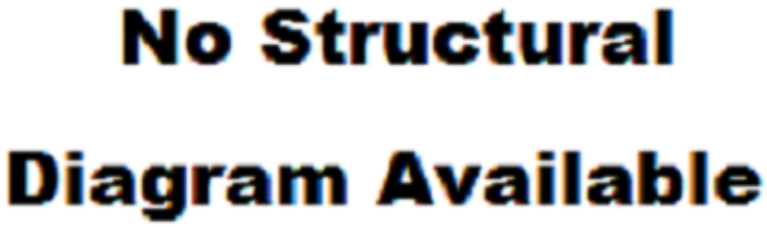
	polymer ethyl 2-propenoate, butyl 2-propenoate, 2-propenenitrile, 2-propenamide, N-hydroxymethyl-2-propenamide polymer ethyl acrylate, n-butyl acrylate, acrylonitrile, acrylamide, N-methylolacrylamide polymer
CAS Number	61467-52-5
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C4H7NO2.C3H5NO.C3H3N)x
Molecular Weight	

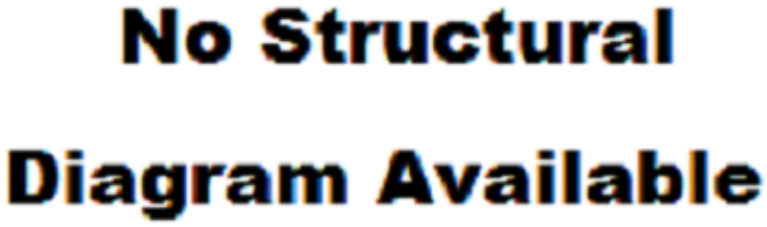
Chemical Name in the Inventory and Synonyms	**Butanedioic acid, methylene-, polymer with ethenylbenzene, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** eEthyl acrylate, styrene, acrylonitrile, N-methylolacrylamide, itaconic acid polymer
CAS Number	61644-67-5
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H8.C5H8O2.C5H6O4.C4H7NO2.C3H3N)x

Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenamide** acrylamide, butyl acrylate, N-methylol acrylamide, ethyl acrylate polymer butyl acrylate, ethyl acrylate, acrylamide, N-methylolacrylamide polymer ethyl 2-propenoate, butyl 2-propenoate, 2-propenamide, N-(hydroxymethyl)-2-propenamide polymer
CAS Number	63149-91-7
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C4H7NO2.C3H5NO)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Butanedioic acid, methylene-, polymer with butyl 2-propenoate, 2-ethylhexyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile**
CAS Number	63929-27-1
Structural Formula	

	
Molecular Formula	(C11H20O2.C7H12O2.C5H6O4.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Butanedioic acid, methylene-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenamide** aAcrylamide, ethyl acrylate, itaconic acid, methylolacrylamide polymer
CAS Number	65292-36-6
Structural Formula	
Molecular Formula	(C5H8O2.C5H6O4.C4H7NO2.C3H5NO)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Butanedioic acid, methylene-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile**

CAS Number	66028-16-8
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H6O4.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and methyl 2-methyl-2-propenoate**
CAS Number	69383-11-5
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H9NO2.C5H8O2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with ethenyl acetate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** N-methylolacrylamide, acrylic acid, vinyl acetate, ethyl acrylate polymer
CAS Number	66991-43-3
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C4H7NO2.C4H6O2.C3H4O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** butyl acrylate, ethyl acrylate, methacrylic acid, N-methylolacrylamide polymer
CAS Number	67785-43-7
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C4H7NO2.C4H6O2)x

Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** 2-propenoic acid, ethyl ester, polymer with 2-propenoic acid, butyl ester, 2-propenenitrile, 2-methyl-2-propenoic acid and N-(hydroxymethyl)-2-propenamide ethyl acrylate, butyl acrylate, acrylonitrile, methacrylic acid, N-methylolacrylamide polymer
CAS Number	67785-51-7
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C4H7NO2.C4H6O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethenyl acetate, 2-ethylhexyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** ethyl acrylate, N-methylolacrylamide, 2-ethylhexyl acrylate, methacrylic acid, vinyl acetate polymer
CAS Number	68555-48-6
Structural Formula	

	
Molecular Formula	(C11H20O2.C5H8O2.C4H7NO2.C4H6O2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, ethenyl acetate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenoic acid** ethyl acrylate, butyl acrylate, N-methylolacrylamide, vinyl acetate, methyl methacrylate, acrylic acid polymer
CAS Number	68555-49-7
Structural Formula	
Molecular Formula	(C7H12O2.C5H8O2.C5H8O2.C4H7NO2.C4H6O2.C3H4O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-methylpropyl 2-propenoate**

	butyl acrylate, isobutyl acrylate, N-methylolacrylamide, methacrylic acid polymer
CAS Number	68555-50-0
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C7H12O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with ethenyl acetate, 2-ethylhexyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** ethyl acrylate, N-methylolacrylamide, 2-ethylhexyl acrylate, acrylic acid, vinyl acetate polymer
CAS Number	68555-52-2
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C11H20O2.C5H8O2.C4H7NO2.C4H6O2.C3H4O2)x

Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with 1,1-dichloroethene and N-(hydroxymethyl)-2-propenamide** 2-propenamide, N-(hydroxymethyl)-, polymer with butyl 2-propenoate and 1,1-dichloroethene butyl acrylate, N-methylolacrylamide, vinylidene chloride copolymer
CAS Number	68874-46-4
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C4H7NO2.C2H2Cl2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, oxiranylmethyl 2-propenoate and 2-propenenitrile** ethyl acrylate, butyl acrylate, N-methylolacrylamide, glycidyl acrylate, acrylonitrile polymer
CAS Number	68929-19-1
Structural Formula	

	
Molecular Formula	(C7H12O2.C6H8O3.C5H8O2.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-propenenitrile** butyl acrylate, methyl methacrylate, ethyl acrylate, N-methylolacrylamide, acrylonitrile polymer
CAS Number	68966-73-4
Structural Formula	
Molecular Formula	(C7H12O2.C5H8O2.C5H8O2.C4H7NO2.C3H3N)x
Molecular Weight	

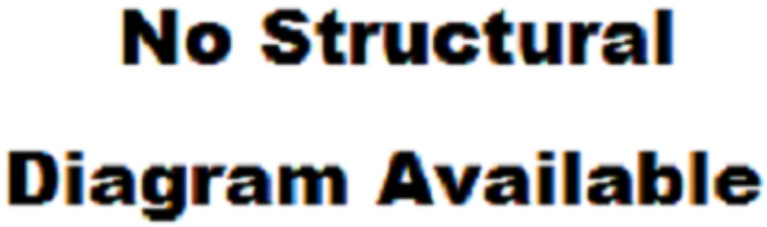
Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with butyl 2-propenoate, ethenylbenzene, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenamide**

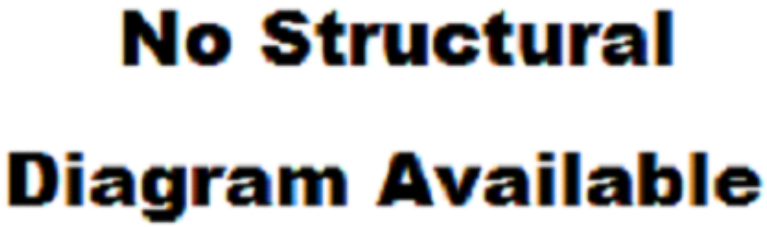
CAS Number	71477-85-5
Structural Formula	No Structural Diagram Available
Molecular Formula	(C8H8.C7H12O2.C5H9NO2.C4H7NO.C3H4O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethene, ethenylacetate and N-(hydroxymethyl)-2-propenamide** ethene, polymer with butyl 2-propenoate, ethenyl acetate and N-(hydroxymethyl)-2-propenamide
CAS Number	81526-97-8
Structural Formula	No Structural Diagram Available
Molecular Formula	(C7H12O2.C4H7NO2.C4H6O2.C2H4)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile**
CAS Number	102082-98-4
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H9NO2.C5H8O2.C5H8O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethenylbenzene,N-(hydroxymethyl)-2-methyl-2-propenamide, methyl 2-propenoate and 2-propenenitrile**
CAS Number	102082-99-5
Structural Formula	

	
Molecular Formula	(C8H8.C7H12O2.C5H9NO2.C4H6O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ammonium 2-propenoate, ethenylbenzene and N-(hydroxymethyl)-2-methyl-2-propenamide**
CAS Number	102561-64-8
Structural Formula	
Molecular Formula	(C8H8.C7H12O2.C5H9NO2.C3H4O2.H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethenyl acetate, ethyl 2-propenoate, 2-hydroxyethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** acetic acid, ethenyl ester, polymer with butyl acrylate, ethyl acrylate, 2-

	hydroxyethyl acrylate and N-(hydroxymethyl)-2-propenamide
CAS Number	102763-15-5
Structural Formula	No Structural Diagram Available
Molecular Formula	(C7H12O2.C5H8O3.C5H8O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, polymer with butyl 2-propenoate, 2-ethylhexyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile**
CAS Number	102958-45-2
Structural Formula	No Structural Diagram Available
Molecular Formula	(C11H20O2.C7H12O2.C5H9NO2.C3H4O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-propenoate, ethenyl acetate, 2-ethylhexyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** 2-ethylhexyl acrylate, butyl acrylate, ethyl acrylate, N-methylolacrylamide, methacrylic acid and vinyl acetate polymer acetic acid, ethenyl ester, polymer with butyl 2-propenoate, 2-ethylhexyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 2-methyl-2-propenoic acid
CAS Number	103226-16-0
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C11H20O2.C7H12O2.C5H8O2.C4H7NO2.C4H6O2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, methyl 2-methyl-2-propenoate and 2-propenenitrile** 2-propenenitrile, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, methyl 2-methyl-2-propenoate, 2-methyl-2-propenoic acid methyl methacrylate, ethyl acrylate, N-methylol acrylamide, methacrylic acid, acrylonitrile polymer
CAS Number	103226-17-1
Structural Formula	

	No Structural Diagram Available
Molecular Formula	(C5H8O2.C5H8O2.C4H7NO2.C4H6O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with ethenyl acetate, N-(hydroxymethyl)-2-propenamide and oxiranylmethyl 2-propenoate** acetic acid ethenyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and oxiranylmethyl 2-propenoate
CAS Number	103226-20-6
Structural Formula	No Structural Diagram Available
Molecular Formula	(C6H8O3.C5H8O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with butyl 2-methyl-2-propenoate, butyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** 2-propenamide, N-(hydroxymethyl)-, polymer with butyl 2-methyl-2-

	propenoate, butyl 2-propenoate and 2-methyl-2-propenoic acid
CAS Number	103226-21-7
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H14O2.C7H12O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethenylbenzene,ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide** benzene, ethenyl-, polymer with butyl 2-propenoate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide
CAS Number	103242-98-4
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C8H8.C7H12O2.C5H8O2.C4H7NO2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethenylacetate, ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide**
CAS Number	103458-34-0
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C4H7NO2.C4H6O2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethenyl acetate, ethenylbenzene and N-(hydroxymethyl)-2-propenamide**
CAS Number	103671-35-8
Structural Formula	**No Structural Diagram Available**

Molecular Formula	(C8H8.C7H12O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide, sodium salt** 2-propenamide, N-(hydroxymethyl)-, polymer with ethyl 2-propenoate and 2-methyl-2-propenoic acid, sodium salt
CAS Number	104072-75-5
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C5H8O2.C4H7NO2.C4H6O2)x.xNa
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate and N-(hydroxymethyl)-2-propenamide, ammonium salt** 2-propenoic acid, ethyl ester, polymer with N-(hydroxymethyl)-2-propenamide and 2-methyl-2-propenoic acid, ammonium salt
CAS Number	104072-76-6
Structural Formula	

	
Molecular Formula	(C5H8O2.C4H7NO2.C4H6O2)x.xH3N
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Butanedioic acid, methylene-, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, 2-propenamide, 2-propenenitrile and 2-propenoic acid** 2-propenoic acid, butyl ester, polymer with acrylamide, acrylic acid, acrylonitrile, itaconic acid and N-methylolacrylamide
CAS Number	104339-59-5
Structural Formula	
Molecular Formula	(C7H12O2.C5H6O4.C4H7NO2.C3H5NO.C3H4O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide, 2-methyl-2-propenamide**

	and 2-propenenitrile
CAS Number	104835-95-2
Structural Formula	
Molecular Formula	(C5H9NO2.C5H8O2.C4H7NO.C4H6O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, ethyl ester, polymer with ethenyl propanoate and N-(hydroxymethyl)-2-propenamide** vinyl propionate, polymer with ethyl acrylate and N-(hydroxymethyl)acrylamide
CAS Number	106006-90-0
Structural Formula	
Molecular Formula	(C5H8O2.C5H8O2.C4H7NO2)x

Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, butyl ester, polymer with ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, hydroxy[(1-oxo-2-propenyl)amino]acetic acid and 2-propenenitrile** 2-propenenitrile, polymer with butyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and hydroxy[(1-oxo-2-propenyl)amino acetic acid
CAS Number	113010-49-4
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C7H12O2.C5H8O2.C5H7NO4.C4H7NO2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with ethyl 2-propenoate, methyl 2-propenoate and N-(hydroxymethyl)-2-propenamide**
CAS Number	116467-99-3
Structural Formula	

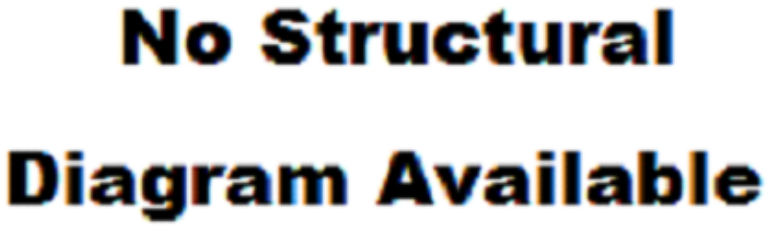
	
Molecular Formula	(C7H10O3.C5H8O2.C4H7NO2.C4H6O2)x
Molecular Weight	

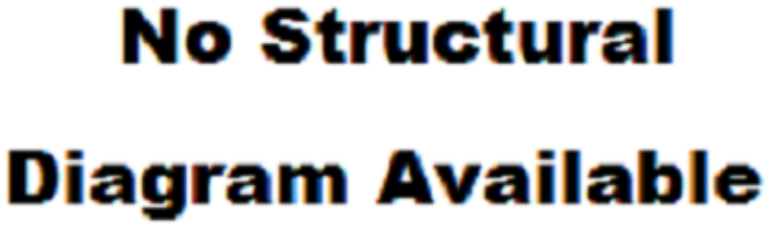
Chemical Name in the Inventory and Synonyms	**Butanedioic acid, methylene-, polymer with ethenyl acetate,N-(hydroxymethyl)-2-propenamide and methyl 2-propenoate** 2-propenamide, N-(hydroxymethyl)-, polymer with ethenyl acetate, methylenebutanedioic acid and methyl 2-propenoate 2-propenoic acid, methyl ester, polymer with ethenyl acetate, N-(hydroxymethyl)-2-propenamide and methylenebutanedioic acid
CAS Number	119948-48-0
Structural Formula	
Molecular Formula	(C5H6O4.C4H7NO2.C4H6O2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide and 3-**

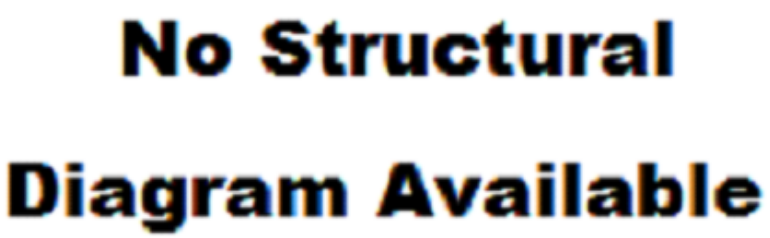
	(trimethoxysilyl)propyl 2-methyl-2-propenoate
CAS Number	124661-40-1
Structural Formula	**No Structural Diagram Available**
Molecular Formula	(C4H7NO2)x.(C3H5NO)x.(C5H8O2)x.(C10H20O5Si)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, polymer with 1,2-ethanediylbis(2-methyl-2-propenoate), 2-ethylhexyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-propenenitrile** 2-propenamide, N-(hydroxymethyl)-2-methyl-, polymer with 1,2-ethanediyl bis(2-methyl-2-propenoate), 2-ethylhexyl 2-propenoate, ethyl 2-propenoate, 2-methyl-2-propenoic acid and 2-propenenitrile 2-propenenitrile, polymer with 1,2-ethanediyl bis(2-methyl-2-propenoate), 2-ethylhexyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide and 2-methyl-2-propenoic acid 2-propenoic acid, 2-methyl-, 1,2-ethanediyl ester, polymer with 2-ethylhexyl 2-propenoate, ethyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide, 2-methyl-2-propenoic acid and 2-propenenitrile 2-propenoic acid, ethyl ester, polymer with 1,2-ethanediyl bis(2-methyl-2-propenoate), 2-ethylhexyl 2-propenoate, N-(hydroxymethyl)-2-methyl-2-propenamide, 2-methyl-2-propenoic acid and 2-propenenitrile
CAS Number	127104-67-0
Structural Formula	

	
Molecular Formula	(C11H20O2.C10H14O4.C5H9NO2.C5H8O2.C4H6O2.C3H3N)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Neononanoic acid, ethenyl ester, polymer with ethenyl acetate and N-(hydroxymethyl) 2-propenamide**
CAS Number	129851-35-0
Structural Formula	
Molecular Formula	(C11H20O2.C4H7NO2.C4H6O2)x
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**2-Propenoic acid, 2-methyl-, methyl ester, polymer with butyl 2-propenoate, N-(hydroxymethyl)-2-propenamide, octadecyl 2-propenoate and 3-(trimethoxysilyl)propyl 2-methyl-2-propenoate**

CAS Number	185529-37-7
Structural Formula	
Molecular Formula	(C4H7NO2)x.(C3H5NO)x.(C5H8O2)x.(C10H20O5Si)x.(C22H42O2)x
Molecular Weight	

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