

Alcohol Ethoxylate

(The number of carbon atoms in alkyl group is 12,16,18,
Number of moles of ethylene oxide (EO) is from 23 to 150)

The document of the safety summary provides usage of chemical substances and safety information to the general public. The safety summary is NOT intended to be an alternative document of Safety Data Sheet which is described from the recommendable detailed safety measures for each use. The safety summary is NOT intended to be an alternate document of the instructions for use nor the warning of consumer products including this substance. The contents of this summary are based on the laws, documents, information, and data available at present, without any warranty.

1. Chemical Identity

Category Name	Alcohol Ethoxylate (The number of carbon atoms in alkyl group is 12,16,18, Number of moles of ethylene oxide (EO) is from 23 to 150)
Substance Name	Polyoxyethylene alkyl (C12, 16, 18) ether (23 - <150)
CAS Number	9002-92-0、9004-95-9、69364-63-2、9005-00-9、9004-98-2

2. Product Uses and Benefits

Alcohol Ethoxylate are nonionic surfactants. Alcohol Ethoxylate is a non-ionic surfactant that is low in stimulation to fiber and skin. It is widely used as consumer products contained in laundry detergents, fabric softener, shampoos, and others. For industrial use, Alcohol Ethoxylate are used as emulsifier and dispersants.

3. Physical/Chemical Properties

As the representative structure of Alcohol Ethoxylate, the physicochemical properties of C12 EO29, C16EO30, C18EO40 (C: the numbers of carbon of the alkyl group, EO: numbers of moles of ethylene oxide) were calculated using computer software EPI suite 4.11 of the U.S. Environmental Protection Agency or measured values are shown below.

Physicochemical properties of Alcohol Ethoxylate

Property	Representative structure		
	C12, EO29	C16, EO30	C18, EO40
Molecular weight	1463.90	1564.06	2032.65
Boiling point (°C)	1307.63	1389.31	1765.13
Melting point (°C)	349.84	349.84	349.84
Vapor pressure (Pa) 25°C	4.41×10^{-39}	5.42×10^{-42}	-
Water solubility (mg/L)	0.344	0.00247	0.00003982
Octanol/water partition coefficient (Log Kow)	-3.10	-1.50	-3.26
Soil adsorption coefficient (Log Koc)	19.2	21.0	29.4

4. Human Health Safety Assessment

Consumer: The exposure to Alcohol Ethoxylate is at safe levels.

Worker: The repeated exposure of Alcohol Ethoxylate does not cause any toxic effects.

Effect Assessment	Result
Acute Toxicity oral/ dermal	Based on the available data, no acute toxicity after oral/ dermal exposure in practical use The substance does not cause damage to any organs following single exposure
Irritation skin/ eye	Based on the available data, unlikely to cause irritation/corrosivity to skin or eyes
Sensitization	Based on the available data, unlikely to cause allergic skin reaction
Toxicity after repeated exposure	Unlikely to cause any toxic effects through prolonged or repeated oral exposure in practical use
Genotoxicity	Based on the available data, unlikely to cause genetic defects
Carcinogenicity	Based on the available data, unlikely to cause cancer
Toxicity for reproduction	Based on the available data, unlikely to be damaging to fertility or the unborn child

5. Environmental Safety Assessment

The test results with fish, aquatic invertebrates and algae suggest that Alcohol Ethoxylate could cause toxicity for aquatic organism and a long-term harmful effect to aquatic organisms. However, Alcohol Ethoxylate is unlikely to persist in the environment because of the readily biodegradation. Alcohol Ethoxylate does not bioaccumulate in the food chain.

Effect Assessment	Result
Aquatic Toxicity	Suggests to cause toxicity for aquatic organism and toxic to aquatic life with long lasting effects
Biodegradation	Readily biodegradable
PBT/ vPvB conclusion	Not persistent in the environment, not bioaccumulating in organisms and not toxic nor very persistent and very bioaccumulating

6. Exposure

- **Consumer**

The consumer can come into contact with the substance in use of the shampoo etc., but the concentration of Alcohol Ethoxylate in use is below the level which would give rise harmful effects of concern. When it's used as the recommended use, consumer should always read product information before use and follow the label/ use instructions.

- **Worker**

The exposure can occur either in Alcohol Ethoxylate manufacturing facilities or in the various industrial facilities when Alcohol Ethoxylate are used. Those workers in industrial operations during maintenance, sampling, testing, or other procedures could be exposed with Alcohol Ethoxylate. Only qualified and trained workers handle the undiluted substance. The manufacturing facilities offer thorough training program for employees and appropriate work processes, as well as safety equipment (goggles and gloves) in place to prevent an unnecessary exposure. Safety showers and eye-wash stations are accessible nearby. Workers are required to be trained in accordance with the safety measures in the Safety Data Sheet.

- **Environment**

Since this substance is used extensively, it is discharged to waste water treatment plants from industrial sites such as manufacturing, preparation, handling, storage and use of the substance as well as from consumer households. However, the substance is readily biodegradable, so that it is removed efficiently in wastewater treatment plants. The substance is biologically degraded in the surface water and is rapidly removed even if it is remained slightly in the wastewater. Hence, the chronic exposure to aquatic organisms of the substance is unlikely to occur. Furthermore, the substance does not accumulate in the food chain, so that there is no concern of human exposure through environmental pathway.

7. Risk management recommendations for industrial use

When you use the substance, make sure to be measured the adequate ventilation. Always use appropriate chemical-resistant gloves to protect your hands and skin and always wear eye protection equipment. Do not eat, drink, or smoke where the substance is handled, processed or stored. Wash hands and skin after contact with the substance. When the substance attaches to skin (or hair), take off the contaminated clothes. Wash with a large amount of water and soap. When it causes your skin irritation, consult doctor (medical diagnosis/therapy). If the substance gets into your eyes, rinse your eyes thoroughly for several minutes. If you wear contact lens, and you can take it off easily, take it off and continue to rinse your eyes. Contact to a doctor immediately.

Wastewater containing the substance must be passed the wastewater treatment plants in order to remove the substance. No specific measures are needed because it is not expected to be released into the air.

8. Regulatory Information/Classification and Labelling

Under GHS classification chemical substances are classified in hazards for physical properties, human health and environment. The hazard information for industrial products are transmitted via specific labels and Safety Data Sheet. GHS offers the standardization for hazard communication. The subjects who could be assumed to be exposed to the substance, workers, consumers, transport workers, and emergency responders, can better understand the hazards of the chemicals in use through the transmission.

Labelling according to UN GHS

UN GHS is the basis for country specific GHS labelling.

Alcohol Ethoxylate is assigned to GHS classification.

Classification and labelling information

Aquatic Acute 3

Hazard Statements:

H402: Harmful to aquatic life

Signal Word

none

The laws of manufacturing, sale, transport, use and disposal are different among countries or areas. Details are referred to Safety Data Sheet provided by the supplier.

9. Conclusion

Though Alcohol Ethoxylate is suggested to cause toxicity to aquatic organisms, the risk to environment organisms is negligible due to the rapid degradation of Alcohol Ethoxylate. In the PBT/vPvB assessments for Alcohol Ethoxylate, the substance is not applicable to

PBT/vPvB. Contact with the undiluted Alcohol Ethoxylate may cause serious damage to the eyes. When handling the substance, workers should follow the standard safety measures and refer to the Safety Data Sheet. Consumers will usually not come into contact with the substance bulk and the substance is used diluted in consumer products, therefore, it is considered that Alcohol Ethoxylate give rise no hazardous effects to human health.

10. Contact

For further information on this substance or Safety Summaries in general, please contact us.

Name	Kao Corporation
URL	https://chemical.kao.com/global/

11. Glossary

Acute Toxicity	Adverse effects that result from a single exposure
Sensitization	Inducibility of allergy
Genotoxicity	Effects to induce gene mutations
Carcinogenicity	Action influence to cause a cancer
Toxicity for Reproduction	Adverse effects for teratogenicity, embryotoxicity, and reproductivity
Biodegradation	Biological degradation of a substance in environments
PBT (Persistent, Bioaccumulative and Toxic)	Substances that are environmentally persistent, bioaccumulative, and toxic
vPvB (Very Persistent and Very Bioaccumulative)	Substances with high persistence in the environment and high accumulation in ecology
GHS	Globally Harmonized System of Classification and Labelling of Chemicals

12. Date of Issue

October 13, 2022