



Guaiacol

Chemical Identity

<i>Brand names</i>	Guaiacol	<i>CAS number</i>	90-05-1
<i>Chemical name (IUPAC)</i>	2-methoxyphenol	<i>Molecular formula</i>	C₇H₈O₂
<i>Synonyms</i>	pyrocatechol monomethyl ether, 1-hydroxy 2-methoxy benzene, <i>orthomethoxyphenol</i>	<i>Molecular weight</i>	124.14 g/mol

Applications

Synthetic Guaiacol is mainly used as an intermediate for Active pharmaceutical materials, for Food materials and for Perfumery products (only under strictly controlled conditions).

Safety Assessment, Exposure and Risk Management Recommendations

Physical and Chemical properties

Property	Result
Physical state	Crystalline solid
Colour	Colourless to pale yellow
Odour	aromatic
Melting point	28 - 32°C
Boiling point	202 - 206°C
Flammability	Non flammable
Water solubility	Soluble
Octanol water partition	Low potential for bioaccumulation

Health effect



Guaiacol causes skin irritation and serious irritation to the eyes and is harmful if swallowed. Safety measures must be respected for industrial uses, for more details, please refer to the Safety Data Sheet.

Environmental effect




Guaiacol is soluble in water, it is readily biodegradable and has a low potential for bioaccumulation. It is not classified as dangerous for the aquatic environment. Industrial emissions and disposal, treatment or recycling must comply with applicable regulations to preserve environment.

Regulatory information and certifications

Classification and labelling

EU regulation (EC) 1272/2008 (CLP)

	Acute toxicity, Oral, Cat 4	H302	Harmful if swallowed
	Skin irritation, Cat 2	H315	Causes skin irritation
	Eye irritation, Cat 2	H319	Causes serious eye irritation
	Warning		

Registration and certification

ISO 9001: 2008 certified
EU regulation on chemicals (EC) 1907/2006 (REACH)

GPS Safety Summary

Guaiacol

General Statement

Guaiacol occurs naturally, it is known for its flavouring properties. It is a hygroscopic product, colourless to slightly yellow with a characteristic aromatic odour, it is solid at room temperature and liquid above 28°C.

Synthetic guaiacol is manufactured in industry and used as an intermediate for the chemical synthesis of active pharmaceuticals, food flavourings and perfumery products.

The pure substance may have adverse effects to human health, it is harmful if swallowed and causes skin irritation and serious eye irritation.

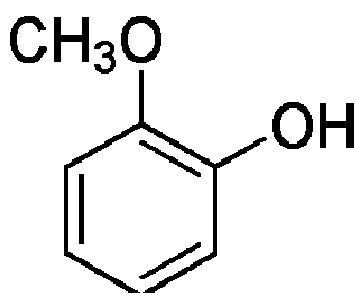
It is only handled in industry, under Strictly Controlled Conditions in accordance with the European REACH regulation for intermediates to control the risk of exposure and preserve human health and environment.

Consumer exposure to guaiacol is not expected.

Chemical Identity

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Brand name:	Guaiacol
Chemical name (IUPAC):	2-methoxyphenol
Synonyms:	pyrocatechol monomethyl ether, 1-hydroxy 2-methoxy benzene, <i>orthomethoxyphenol</i>
CAS number:	90-05-1
EC number:	201-964-7
Molecular formula:	C ₇ H ₈ O ₂

Structure:



Uses and applications

Guaiacol is a naturally occurring organic compound. Although it is biosynthesized by a variety of organisms, this colourless aromatic oil is usually derived from guaiacum or wood creosote. Samples darken upon exposure to air and light. Guaiacol is present in wood smoke, resulting from the pyrolysis of lignin. It contributes to the flavour of many compounds, e.g. roasted coffee.

Guaiacol is industrially produced by methylation of catechol. This route of synthesis is far more environmentally friendly than the o-nitrochlorobenzene route.

The production is performed using conventional closed vessels. The process is widely acknowledged as the Best Available Technology in terms of reduced water and energy consumption.

Synthetic guaiacol is a precursor to various flavourings such as vanillin (synthetic “vanilla” aroma and flavour), used in food industry, perfumery, home and personal care products.

Its derivatives are used medicinally as an expectorant, antiseptic, and local anesthetic.

Physical/Chemical Properties

Phys/Chem Safety Assessment

Property	Value
Physical state	Solid at 20°C and atmospheric pressure Liquid above 28°C as a supercooled liquid
Form	Crystalline
Colour	Colourless to pale yellow
Odour	Characteristic of aromatic compounds
Molecular weight	124.14 g/mol
Relative density	1.11 – 1.13 at 20°C
Melting Point range	28 - 32°C
Boiling Point range	202 – 206 °C
Flash point	90°C (closed cup) at atm pressure, non flammable
Explosive properties	Non explosive
Self-ignition temperature	375°C at atmospheric pressure
Vapour pressure	0.14 hPa at 25°C
Water solubility	14.3 – 23.3 g/l at room temperature, soluble
Octanol Water partition coefficient (log Kow)	1.36 – 1.57 at 30°C, low potential for bioaccumulation

Based on available data, guaiacol is not classified regarding physical and chemical hazards, according to EU regulation (EC) 1272/2008.

Health Effects

Human Health Safety Assessment

Effect Assessment	Result
Acute Toxicity Oral/inhalation/dermal	Harmful if swallowed Not classified for inhalation or dermal routes
Irritation / corrosion Skin/eye	Causes serious eye irritation Causes skin irritation
Sensitisation	Not classified for sensitisation
Toxicity after repeated exposure Oral/inhalation/dermal	Not classified for toxicity after repeated exposure
Genotoxicity / Mutagenicity	Not classified for either mutagenicity or genotoxicity
Carcinogenicity	Not classified for carcinogenicity
Toxicity for reproduction	No data available and not needed regarding regulation

All these results are based on available data and the classification is in accordance with EU regulation (EC) 1272/2008.

Environmental Effects

Environment Safety Assessment

Effect Assessment	Result
Aquatic Toxicity	Harmful to invertebrates and fish Not harmful to algae and micro-organisms

Fate and behaviour	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not potentially bioaccumulative (Log Kow = 1.36 – 1.57)
PBT / vPvB conclusion	Not considered to be either PBT nor vPvB

Based on available data, guaiacol is considered to be harmful towards aquatic invertebrates and fish but as it is readily biodegradable and not potentially bioaccumulative, it is not classified as dangerous for the environment, according to EU regulation (EC) 1272/2008.

Exposure

Guaiacol is manufactured in a closed, continuous and automated process which minimizes workers and environment exposure potential and is handled under Strictly Controlled Conditions in accordance with the REACH regulation for intermediates.

Human health

Where there is a risk of workers exposure, during (un)loading, sampling, analysis or maintenance operations, it is kept at a safe level (strictly below exposure limits, when applied) and controlled by the use of appropriate risk management measures as the substance may be irritating for eyes and skin and may be harmful if swallowed.

Environment

Based on its physical and chemical properties, if guaiacol is released in the environment, it will be distributed mainly in the water. As it is readily biodegradable, it will not be persistent.

Guaiacol has a low potential for bioaccumulation.

It is not expected to have a high adsorptive behaviour and its volatilisation from soil or water is not expected to be important.

During industrial manufacture, effluents that may contain the substance are directed to waste water treatment plant.

Risk Management Recommendations

Guaiacol is manufactured and handled under Strictly Controlled Conditions, based on a risk management system, in accordance with the REACH regulation for intermediates.

Human health

For industrial uses of guaiacol, workers must be well informed and trained and must refer to the Safety Data Sheet (SDS). If there is a risk of exposure to guaiacol (during (un)loading, sampling, analysis or maintenance operations), handling must be performed under an adequate and efficient ventilation, appropriate personal protective equipment (PPE) must be worn (safety glasses with side-shields, gloves, protective suit and respirator with approved filter in case of dust or aerosol formation) as recommended in the SDS, and hygiene measures must be respected (accessible emergency equipment, well-maintained PPE, wash hands and skin following contact, do not eat, drink or smoke on the workplace), as guaiacol may be irritating for eyes and skin and may be harmful if swallowed.

Environment

All effluent releases that may contain the substance must be directed to a waste water treatment plant. Disposal, treatment or recycling of industrial waste must comply with applicable regulations to preserve environment.

State Agency Review

Guaiacol has been registered under EU regulation (EC) 1907/2006 (REACH).

Regulatory Information / Classification and Labelling

Substance classification and labelling according to EU regulation (EC) 1272/2008 (CLP):

Classification

Acute toxicity, Oral, Category 4
Skin irritation, Category 2
Eye irritation, Category 2

H302 Harmful if swallowed
H315 Causes skin irritation
H319 Causes serious eye irritation

Labelling



Signal word : WARNING

Hazard statements :

H302 Harmful if swallowed
H315 Causes skin irritation
H319 Causes serious eye irritation

Precautionary statements :

P102 Keep out of reach of children
P305+351+338: IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Contact information within company

For further information on this substance or product safety summaries in general, please contact:

Rhodia Global product Strategy: http://www.rhodia.com/en/sustainability/global_product_strategy/index.tcm

Contact: globalproductstrategy@eu.rhodia.com

Additional information

ICCA Global Product Strategy: <http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

(extended) Safety Data Sheet available on demand: http://www.rhodia.com/en/contact/contact_form_business.tcm

Glossary of technical terms: http://www.rhodia.com/en/sustainability/global_product_strategy/glossary/index.tcm

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Disclaimer

The information provided in the present Safety Summary is based on European data available in REACH regulatory dossier (EC N°1907/2006) and is correct to the best of our knowledge, information and belief at the date of its publication. Such information is only intended to provide a general overview of the chemical substance in the context of ICCA Global Product Strategy and is not to be considered as a warranty or quality specification. It does not replace the safety data sheet and technical sheets. Thus, the information provided in this Safety Summary only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in another manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.