Chemicals with limited data availability that may be used in hair dyes overseas: Human health tier II assessment

01 July 2016

Chemicals in this assessment

Chemical Name in the Inventory	CAS Number
Ethanaminium, N-[9-(2-carboxyphenyl)-6-(diethylamino)-3H-xanthen-3-ylidene]-N-ethyl-, chloride	81-88-9
2,3-Naphthalenediol	92-44-4
1,4-Benzenediamine, N,N-diethyl-	93-05-0
1,2-Benzenediamine, 4-chloro-	95-83-0
1,4-Benzenediamine, N,N-dimethyl-	99-98-9
1,3,5-Benzenetriol	108-73-6
Phenol, 4-amino-2-nitro-	119-34-6
1,4-Benzenediamine, N-(4-aminophenyl)-	537-65-5
2-Naphthalenesulfonic acid, 7-(benzoylamino)-4-hydroxy-3-[[4-[(4-sulfophenyl)azo]phenyl]azo]-, disodium salt	2610-11-9

Chemical Name in the Inventory	CAS Number
Benzenesulfonic acid, 2,2'-(1,2-ethenediyl)bis[5-[(4-ethoxyphenyl)azo]-, disodium salt	2870-32-8
1,4-Benzenediamine, N4-methyl-2-nitro-	2973-21-9
1,3-Benzenediamine, 4-nitro-	5131-58-8
1,4-Benzenediamine, N,N-diethyl-, sulfate	6065-27-6
1,4-Benzenediamine, N,N-dimethyl-, sulfate	6219-73-4
Ethanol, 2-[methyl[4-(methylamino)-3-nitrophenyl]amino]-	10228-03-2
Phenol, 4-amino-2-(methoxymethyl)-	29785-47-5
Cuprate(2-), [.mu.-[[7,7'-iminobis[4-hydroxy-3-[[2-hydroxy-5-[(methylamino)sulfonyl]phenyl]azo]-2-naphthalenesulfonato]](6-)]]di-, disodium	37279-54-2
Phenol, 4-amino-2-(methoxymethyl)-, monohydrochloride	135043-65-1
Ethanol, 2-[(4-methoxy-2,6-dinitrophenyl)amino]-	122252-11-3
Ethanol, 2,2'-[(3,5-diamino-2,6-pyridinediyl)bis(oxy)]bis-	117907-42-3
3-Pyridinol, 5-amino-2,6-dimethoxy-	104333-03-1
1,2-Propanediol, 3-[[4-[(2-hydroxyethyl)methylamino]-2-nitrophenyl]amino]-	102767-27-1
Benzenaminium, 3-[[4-[[diamino(phenylazo)phenyl]azo]-2-methylphenyl]azo]-N,N,N-trimethyl-, chloride	83803-99-0
Benzenaminium, 3-[[4-[[diamino(phenylazo)phenyl]azo]-1-naphthalenyl]azo]-N,N,N-trimethyl-, chloride	83803-98-9
1,3-Benzenediamine, 4-ethoxy-, sulfate (1:1)	68015-98-5
1,3-Propanediol, 2-[(2-amino-4-nitrophenyl)amino]-2-(hydroxymethyl)-	56932-45-7

Chemical Name in the Inventory	CAS Number
Ethanol, 2-(4-amino-3-nitrophenoxy)-	50982-74-6
1,3-Benzodioxol-5-amine	14268-66-7
C.I. Basic Red 46	12221-69-1
1H-1,2,4-Triazolium, 1,2(or 1,4)-dimethyl-3(or 5)-[[4-[methyl(phenylmethyl)amino]phenyl]azo]-, bromide	89959-98-8
Ethanol, 2-[(4-methoxy-2-nitrophenyl)amino]-	57524-53-5
Phenol, 2-amino-6-methyl-	17672-22-9

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

NICNAS has made every effort to assure the quality of information available in this report. However, before relying on it for a specific purpose, users should obtain advice relevant to their particular circumstances. This report has been prepared by NICNAS

ACRONYMS & ABBREVIATIONS

Grouping Rationale

The chemicals in this group have reported uses in hair dye preparations overseas. Based on a review of publicly available hazard information in accordance with the IMAP Framework (NICNAS, 2013), limited empirical toxicological data were identified for all of the chemicals in this group.

For chemicals with limited data, NICNAS commonly uses the principles of 'read across' in accordance with the Organisation for Economic Co-operation and Development (OECD) *Guidance on grouping of chemicals* (OECD, 2014) based on the known properties of similar chemicals (analogues). The quality of the data used is dependent on the similarity of the analogues to the chemicals themselves. However, the relevant analogues identified for the chemicals in this group also have limited toxicological information for which to characterise the hazards and, therefore, are not considered suitable. Therefore, other approaches such as the analysis of Quantitative Structure-Activity Relationship (QSAR) modelling information is required to characterise the hazards of the chemicals.

The critical concern for hair dye chemicals relates to their potential skin sensitisation, mutagenicity and carcinogenicity. As such, these health hazards will be the focus of this assessment, with other hazards not considered.

Import, Manufacture and Use

Australian

No specific Australian use, import, or manufacturing information has been identified for all of the chemicals in this group.

International

The following international uses have been identified through:

- Galleria Chemica;
- the Substances and Preparations in Nordic countries (SPIN) database;
- the European Commission Cosmetic Ingredients and Substances (CosIng) database;
- the United States (US) Personal Care Product Council International Nomenclature of Cosmetic Ingredients (INCI) Dictionary;
- the Compilation of Ingredients Used in Cosmetics in the US (CIUCUS) (Personal Care Products Council, 2011);
- the US Environmental Protection Agency's Aggregated Computer Toxicology Resource (ACToR); and
- the US National Library of Medicine's Hazardous Substances Data Bank (HSDB).

All of the chemicals have reported cosmetic use as hair dyes. Basic Violet 10 has reported use in tattoo inks (Hauri, 2011).

Some of the chemicals have reported site-limited use including as:

- a biological stain and laser dye (Rhodamine B, CAS No. 81-88-9);

- a complexing reagent (2,3-dihydroxynaphthalene, CAS No. 92-44-4);
- a laboratory reagent (N,N-diethyl-p-phenylenediamine, CAS No. 93-05-0; 4-chloro-o-phenylenediamine, CAS No. 95-83-0; 4-amino-N,N-dimethylaniline sulfate, CAS No. 6219-73-4); and
- an intermediate (Rhodamine B, CAS No. 81-88-9; 4-amino-2-nitrophenol, CAS No. 119-34-6; 4-nitro-1,3-benzenediamine, CAS No. 5131-58-8; methylenedioxyaniline, CAS No. 14268-66-7).

Restrictions

Australian

The chemicals N,N-diethyl-p-phenylenediamine (CAS No. 93-05-0), 4-chloro-o-phenylenediamine (CAS No. 95-83-0), N,N-diethyl-p-phenylenediamine (CAS No. 99-98-9), N-methyl-2-nitrobenzene-1,4-diamine (CAS No. 2973-21-9), and 4-nitro-1,3-benzenediamine (CAS No. 5131-58-8) come under the *Poisons Standard*—the *Standard for the Uniform Scheduling of Medicines and Poisons* (SUSMP) entries in Schedule 6 and Appendix C (SUSMP, 2014).

Schedule 6:

'PHENYLENEDIAMINES and alkylated phenylenediamines not elsewhere specified in these Schedules:

(a) in preparations packed and labelled for photographic purposes;

(b) in preparations packed and labelled for testing water **except** tablets containing 10 mg or less of diethylpara-phenylenediamine or dimethyl-para-phenylenediamine in opaque strip packaging provided the directions for use include the statement, "Do not discard testing solutions into the pool";

(c) in hair dye preparations **except** when the immediate container and primary pack are labelled with the following statements: KEEP OUT OF REACH OF CHILDREN, and WARNING - This product contains ingredients which may cause skin irritation to certain individuals. A preliminary test according to the accompanying directions should be made before use. This product must not be used for dyeing eyelashes or eyebrows; to do so may be injurious to the eye. Written in letters not less than 1.5 mm in height; or

(d) in eyelash and eyebrow tinting products when the immediate container and primary pack are labelled with the following statement: WARNING - This product contains ingredients which may cause skin irritation to certain individuals, and when used for eyelash and eyebrow tinting may cause injury to the eye. A preliminary test according to the accompanying directions should be made before use. Written in letters not less than 1.5 mm in height.'

Appendix C:

'PHENYLENEDIAMINES in preparations for skin colouration and dyeing of eyelashes or eyebrows **except** when included in Schedule 6.'

Schedule 6 chemicals are described as 'Substances with a moderate potential for causing harm, the extent of which can be reduced through the use of distinctive packaging with strong warnings and safety directions on the label'. Schedule 6 chemicals are labelled with 'Poison' (SUSMP, 2014).

Appendix C chemicals are substances of such danger to health as to warrant prohibition of sale, supply and use.

International

All of the chemicals in this group are listed in the European Union (EU) Cosmetics Regulation 1223/2009 Annex II—List of substances prohibited in cosmetic products (Galleria Chemica).

Additionally, Rhodamine B (CAS No. 81-88-9), 2,3-dihydroxynaphthalene (CAS No. 92-44-4), N,N-diethyl-p-phenylenediamine (CAS No. 93-05-0), 4-chloro-o-phenylenediamine (CAS No. 95-83-0), N,N-dimethyl-p-phenylenediamine (CAS No. 99-98-9), 4-amino-2-nitrophenol (CAS No. 119-34-6), 2-(methoxymethyl)-4-aminophenol (CAS No. 29785-47-5), HC Yellow No. 3 (CAS No.

56932-45-7), 4-ethoxybenzene-1,3-diammonium sulfate (CAS No. 68015-98-5), and pyridine, 3,5-diamino-2,6-bis(2-hydroxyethoxy)- (CAS No. 117907-42-3) are present in one or more of the following lists (Galleria Chemica):

- Association of South East Asian Nations (ASEAN) Cosmetic Directive Annex II Part 1: List of substances which must not form part of the composition of cosmetic products;
- Health Canada List of prohibited and restricted cosmetic ingredients (The Cosmetic Ingredient 'Hotlist'); and
- New Zealand Cosmetic Products Group Standard—Schedule 4: Components cosmetic products must not contain.

Existing Worker Health and Safety Controls

Hazard Classification

Two of the chemicals in this group are classified as hazardous, with the following risk phrases for human health in the Hazardous Substances Information System (HSIS) (Safe Work Australia):

N,N-diethyl-p-phenylenediamine (CAS No. 93-05-0):

- T; R25 (acute toxicity); and
- C: R34 (corrosivity).

N,N-dimethyl-p-phenylenediamine (CAS No. 99-98-9):

- T: R23/24/25 (acute toxicity).

The rest of the chemicals are not listed on the HSIS (Safework Australia).

Exposure Standards

Australian

No specific exposure standards are available.

International

No specific exposure standards are available.

Health Hazard Information

Limited or no toxicological data are available for the chemicals in this group.

The European Commission's (EC) Scientific Committee on Consumer Safety (SCCS), formerly known as the Scientific Committee on Cosmetic Products and Non-Food Products intended for Consumers (SCCNFP) and the Scientific Committee on Consumer Products (SCCP), provided scientific opinions on hair dye use and bladder cancer (SCCNFP, 2001; SCCNFP, 2004) and personal use of hair dyes and cancer risk (SCCP, 2005) based on epidemiological studies in Europe, the United States of America (USA), and Japan. The evaluations indicated a causal link between personal and occupational hair dye use and cancer.

The chemical 4-chloro-o-phenylenediamine (CAS No. 95-83-0) was classified by the International Agency for Research on Cancer (IARC) as a Group 2B carcinogen (Possibly carcinogenic to humans) (IARC, 1982). Rhodamine B (CAS No. 81-88-9) and 4-amino-2-nitrophenol (CAS No. 119-34-6) were classified by IARC as Group 3 carcinogens (Not classifiable as to their carcinogenicity in humans) (IARC, 1978).

The United States National Toxicology Program (US NTP) has available genotoxicity tests for N,N-diethyl-p-phenylenediamine (CAS No. 93-05-0), N,N-dimethyl-p-phenylenediamine (CAS No. 99-98-9), and 4-nitro-1,3-benzenediamine (CAS No. 5131-58-8), which showed that all chemicals were positive for mutagenicity in *Salmonella typhimurium* (Ames tests), sister chromatid exchange, and chromosomal aberration assays (US NTP).

The following tools were used to ascertain the mutagenicity and carcinogenicity potential of the chemicals:

- OECD QSAR Toolbox v3.2 profiling functionalities; and
- Optimized Approach based on Structural Indices Set–TIssue MEtabolism Simulator (OASIS–TIMES) v2.27.14 QSAR modelling for which predictions were obtained from the following models: in vitro Ames, in vitro chromosomal aberration, in vivo micronucleus test, and in vivo liver genotoxicity.

All the chemicals in this group either have functional groups that present alerts for mutagenicity and carcinogenicity potential based on their molecular structures as profiled by the OECD QSAR Toolbox, or were predicted to be positive for mutagenicity in one or more of the OASIS–TIMES genotoxicity models.

Another critical health concern for hair dyes is their potential for skin sensitisation. Skin sensitisation predictions using OASIS–TIMES were negative for all the chemicals. However, the possible metabolites of the majority of chemicals in this group, based on the metabolism simulators of OASIS–TIMES, were predicted to be strong skin sensitisers. The chemicals identified as CI Basic Red 46 (CAS No. 12221-69-1) and Basic Red 46 (CAS No. 89959-98-8) have been classified as skin sensitisers by NICNAS (NICNAS, 2005).

Some of the predictions were out of the applicability domain of the OASIS–TIMES models for skin sensitisation and genotoxicity, which indicates greater uncertainty about the reliability of the models since the performance statistics from the training set may not be applicable to the chemicals in this group. However, in the absence of any other information, the results from the QSAR model predictions will be considered in the weight of evidence analysis of the health effects of the chemicals.

Risk Characterisation

Critical Health Effects

Based on the limited data available, the chemicals have been identified as having the potential to cause systemic long-term effects (genotoxicity and carcinogenicity). Some of the chemicals in this group also have been identified as having the potential to cause skin sensitisation. Other health hazards have not been considered.

Public Risk Characterisation

The public could be exposed to the chemicals in this group if they are used in hair dye preparations or other cosmetic products in Australia. The extent of current usage is unknown, as the chemicals in this group were not notified as being used in hair dye preparations in Australia.

The directions for use in hair dye preparations normally include instructions for pre-testing for skin sensitisation. Therefore, the local effects, including skin sensitisation, are not a high priority for assessment compared with the concerns about genotoxicity and carcinogenicity which, if validated, would be expected to be the dominant driver for appropriate risk management measures.

Several of the chemicals are prohibited or restricted internationally, particularly for use in cosmetics (see **Restrictions: International**).

Overall, there is sufficient uncertainty regarding the safety of these chemicals in cosmetic products to warrant a Tier III assessment, including consultation with industry to determine the extent of use and the availability of further genotoxicity and carcinogenicity data (see **Recommendation**).

Occupational Risk Characterisation

During product formulation, oral, dermal, ocular and/or inhalation exposure of workers to the chemical may occur, particularly where manual or open processes are used. These may include transfer and blending activities, quality control analysis, and cleaning and maintaining equipment. Worker exposure to the chemical at lower concentrations may also occur while using formulated products containing the chemical. The level and route of exposure will vary depending on the method of application and work practices employed.

The occupations of hairdresser and barber has been classified by the IARC as a Group 2A (Probably carcinogenic to humans) carcinogen (IARC, 2012).

Overall, there is sufficient uncertainty regarding the hazards of these chemicals in the workplace to justify a Tier III assessment, depending on the outcomes of industry consultations (see **Recommendation**), to determine the appropriate occupational controls.

NICNAS Recommendation

The chemicals in this group are recommended for Tier III assessment to determine:

- whether the chemicals are being used in hair dye preparations in Australia;
- any other uses of the chemicals in Australia;
- the availability of toxicological information that is not accessible in the publicly-available literature to better characterise the hazards of the chemicals; and
- whether risk management controls are required.

Regulatory Control

References

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Galleria Chemica. Accessed March 2015 at **http://jr.chemwatch.net/galeria/**

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International Agency for Research on Cancer (IARC) 2012. IARC monographs on the evaluation of carcinogenic risks to humans, Volume 99. Occupational exposures of hairdressers and barbers and personal use of hair colourants. Accessed March 2015 at **http://monographs.iarc.fr/ENG/Monographs/vol99/mono99-17.pdf**

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Personal Care Products Council 2011. Compilation of Ingredients Used in Cosmetics in the United States (CIUCUS), 1st Edition.

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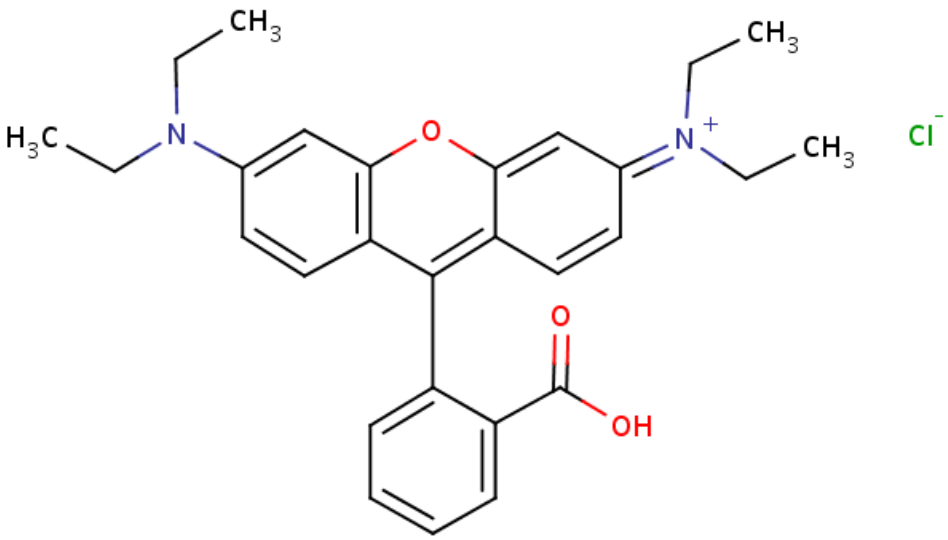
US Environmental Protection Agency's Aggregated Computational Toxicology Resource (ACToR). Accessed March 2015 at **http://actor.epa.gov/actor/faces/ACToRHome.jsp**

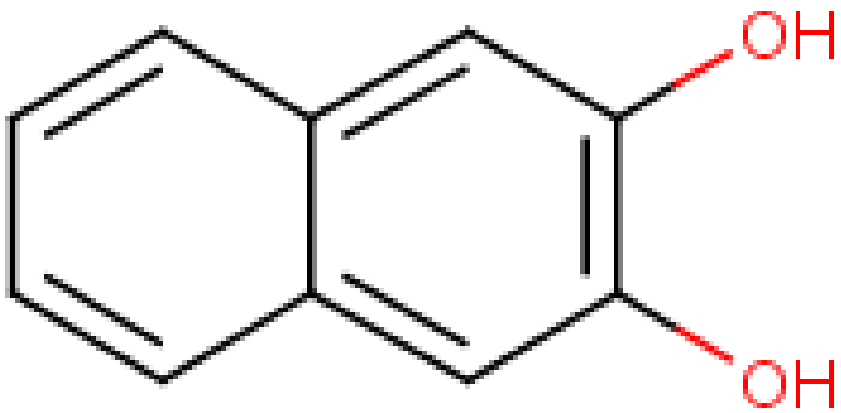
Last Update 01 July 2016

Chemical Identities

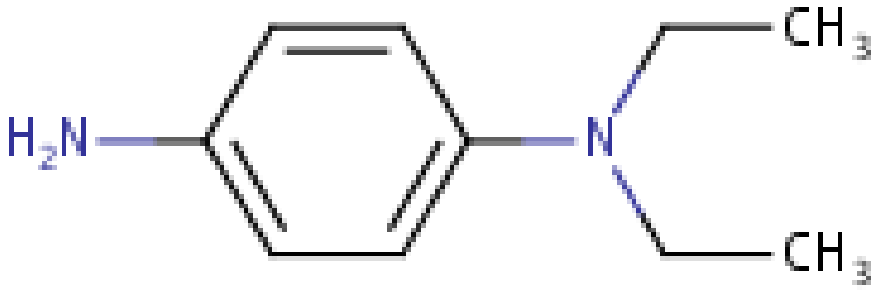
Chemical Name in the Inventory and Synonyms	**Ethanaminium, N-[9-(2-carboxyphenyl)-6-(diethylamino)-3H-xanthen-3-ylidene]-N-ethyl-, chloride** Rhodamine B C.I. basic violet 10 ammonium, (9-(o-carboxyphenyl)-6-(diethylamino)-3H-xanthen-3-ylidene)diethyl-, chloride C.I. Food Red 15 D&C Red 19
CAS Number	81-88-9
Structural Formula	

	
Molecular Formula	C28H31N2O3.Cl
Molecular Weight	479.017

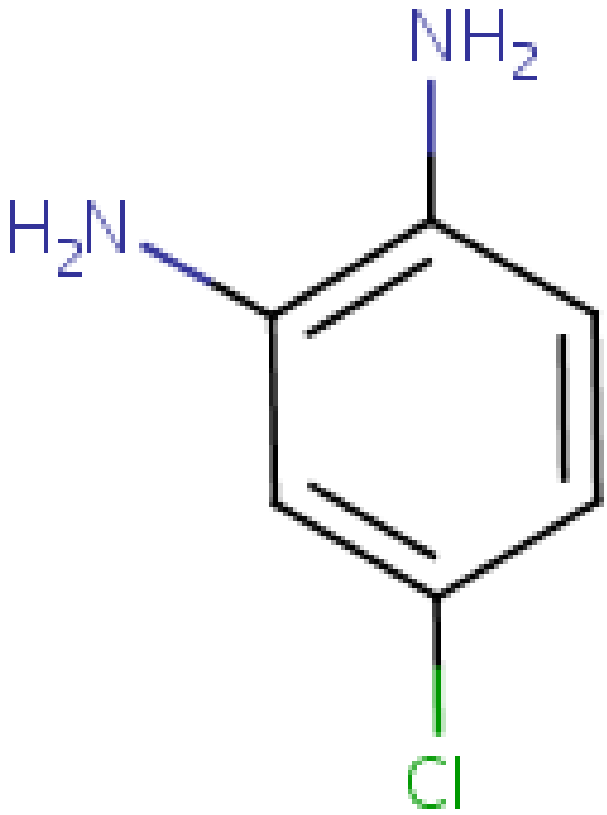
Chemical Name in the Inventory and Synonyms	**2,3-Naphthalenediol** 2,3-dihydroxynaphthalene naphthalene-2,3-diol
CAS Number	92-44-4
Structural Formula	

	
Molecular Formula	C10H8O2
Molecular Weight	160.171

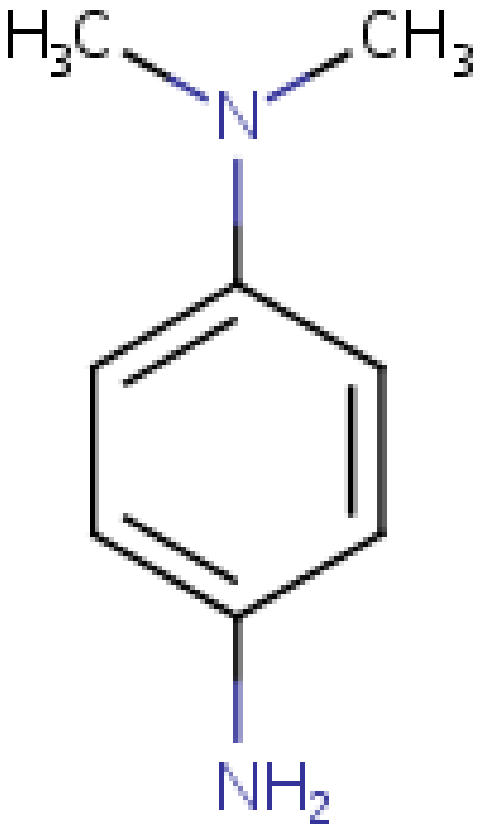
Chemical Name in the Inventory and Synonyms	**1,4-Benzenediamine, N,N-diethyl-** N,N-diethyl-p-phenylenediamine
CAS Number	93-05-0
Structural Formula	

	
Molecular Formula	C10H16N2
Molecular Weight	164.25

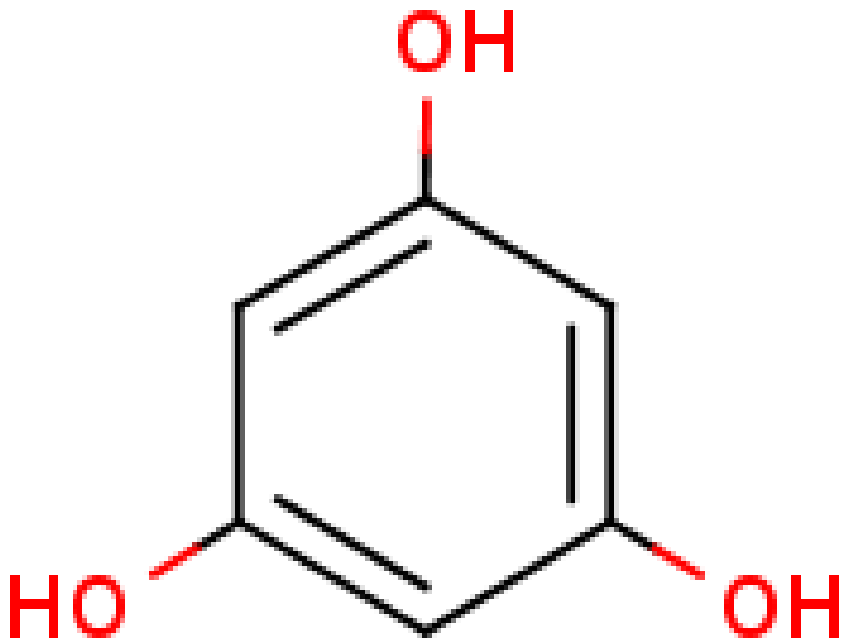
Chemical Name in the Inventory and Synonyms	**1,2-Benzenediamine, 4-chloro-** 4-chloro-o-phenylenediamine 1,2-diamino-4-chlorobenzene
CAS Number	95-83-0
Structural Formula	

	
Molecular Formula	C6H7ClN2
Molecular Weight	142.5883

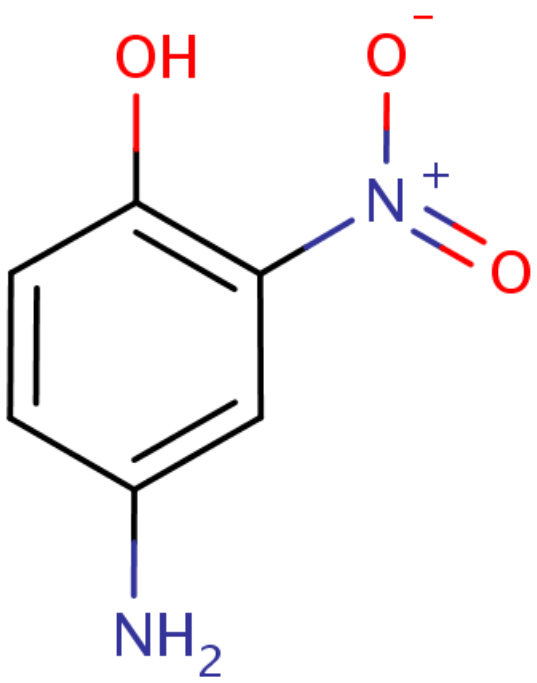
Chemical Name in the Inventory and Synonyms	**1,4-Benzenediamine, N,N-dimethyl-** N,N-dimethyl-p-phenylenediamine 4-amino-N,N-dimethylaniline CI 76075
CAS Number	99-98-9
Structural Formula	

	
Molecular Formula	C8H12N2
Molecular Weight	134.197

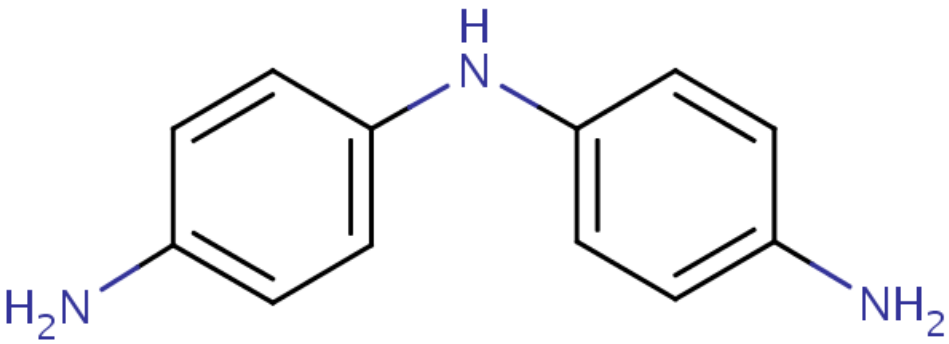
Chemical Name in the Inventory and Synonyms	**1,3,5-Benzenetriol** phloroglucinol 1,3,5-trihydroxybenzene
CAS Number	108-73-6
Structural Formula	

	
Molecular Formula	C6H6O3
Molecular Weight	126.11

Chemical Name in the Inventory and Synonyms	**Phenol, 4-amino-2-nitro-** 4-amino-2-nitrophenol CI 76555
CAS Number	119-34-6
Structural Formula	

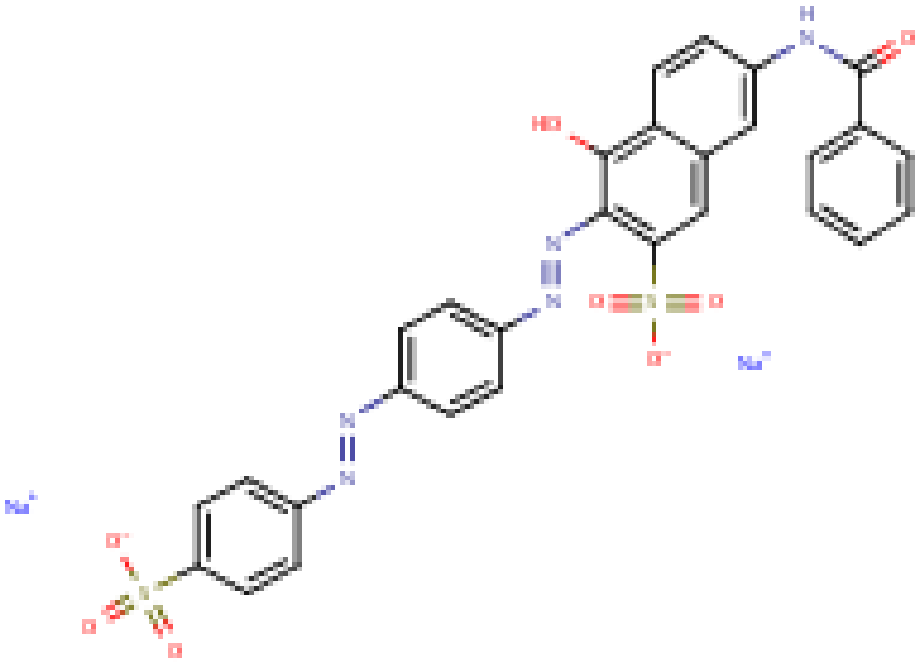
	
Molecular Formula	C6H6N2O3
Molecular Weight	154.1244

Chemical Name in the Inventory and Synonyms	**1,4-Benzenediamine, N-(4-aminophenyl)-** 4,4'-iminodianiline CI 76120
CAS Number	537-65-5
Structural Formula	

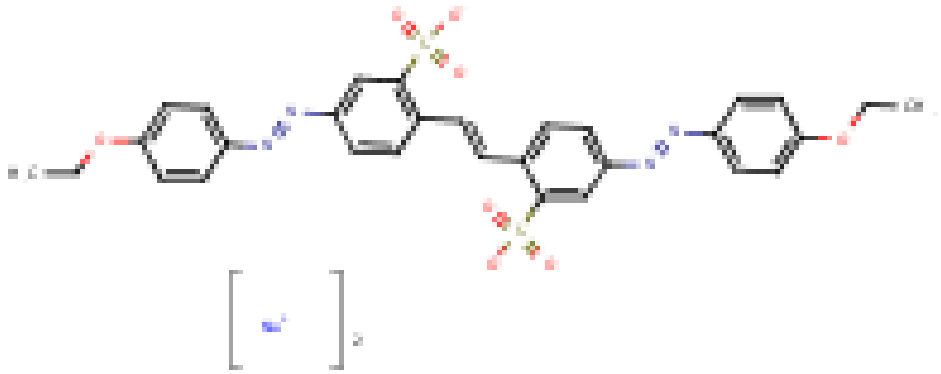


Molecular Formula	C12H13N3
Molecular Weight	199.256

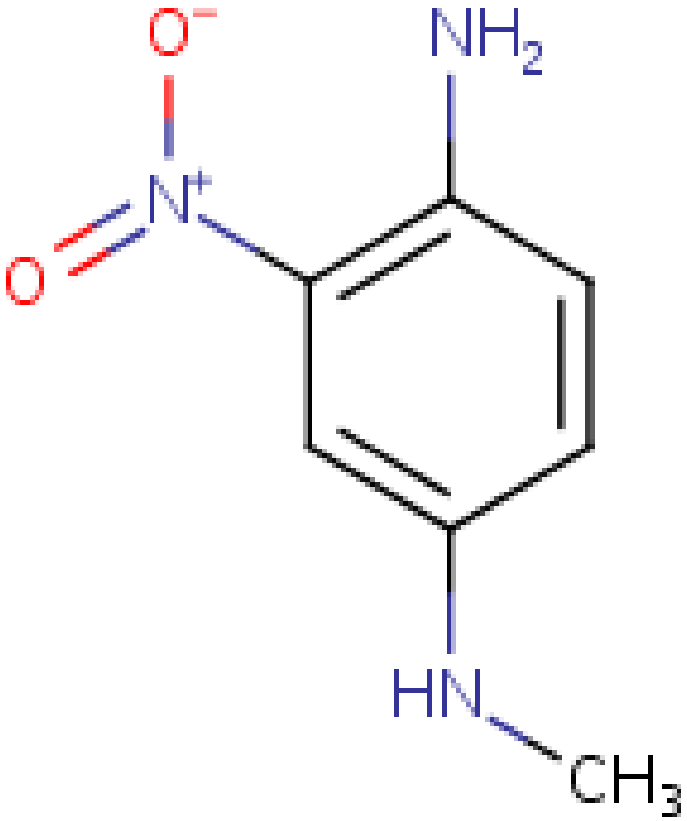
Chemical Name in the Inventory and Synonyms	**2-Naphthalenesulfonic acid, 7-(benzoylamino)-4-hydroxy-3-[[4-[(4-sulfophenyl)azo]phenyl]azo]-, disodium salt** C.I. Direct Red 81 C.I. 28160
CAS Number	2610-11-9
Structural Formula	

	
Molecular Formula	C29H21N5O8S2.2Na
Molecular Weight	675.6

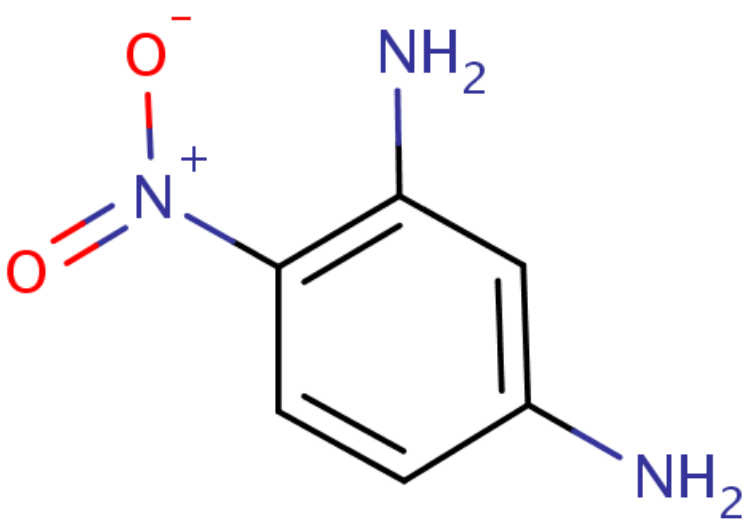
Chemical Name in the Inventory and Synonyms	**Benzenesulfonic acid, 2,2'-(1,2-ethenediyl)bis[5-[(4-ethoxyphenyl)azo]-, disodium salt** C.I. 24895 chrysophenine
CAS Number	2870-32-8
Structural Formula	

	
Molecular Formula	C30H28N4O8S2.2Na
Molecular Weight	

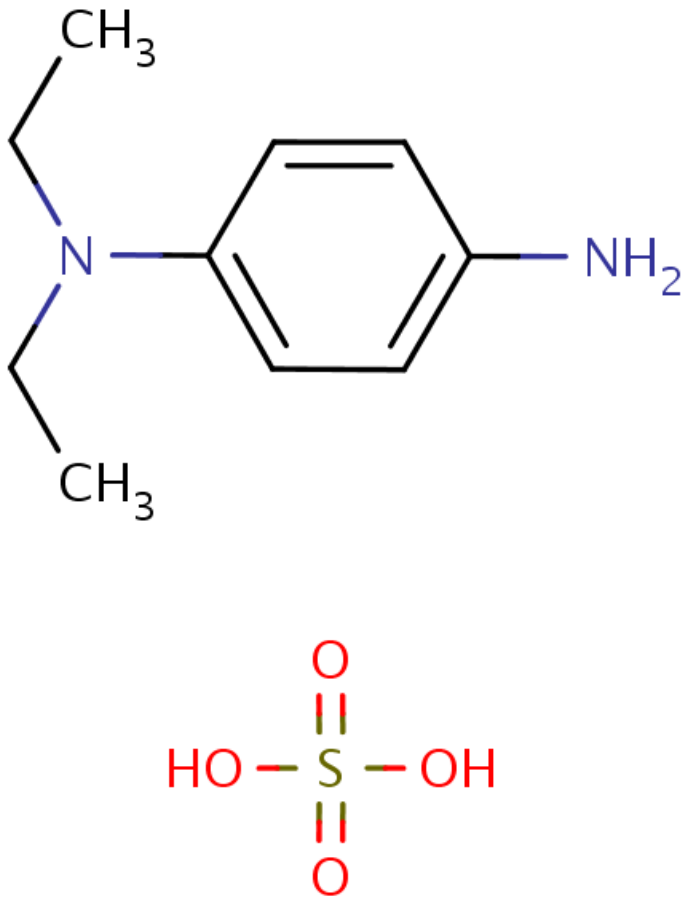
Chemical Name in the Inventory and Synonyms	**1,4-Benzenediamine, N4-methyl-2-nitro-** N-methyl-2-nitrobenzene-1,4-diamine
CAS Number	2973-21-9
Structural Formula	

	
Molecular Formula	C7H9N3O2
Molecular Weight	167.167

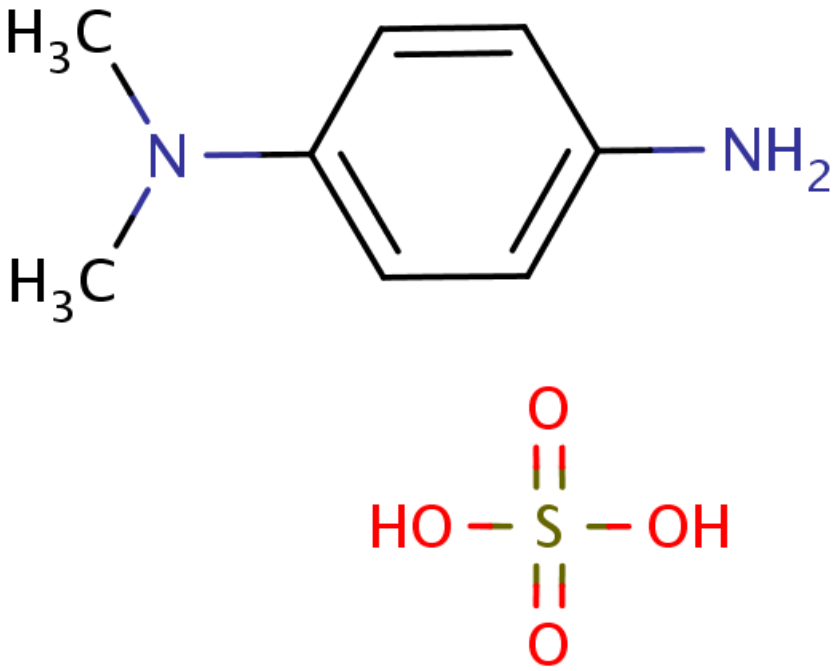
Chemical Name in the Inventory and Synonyms	**1,3-Benzenediamine, 4-nitro-** 4-nitro-1,3-benzenediamine N-methyl-2-nitrobenzene-1,4-diamine
CAS Number	5131-58-8
Structural Formula	

	
Molecular Formula	C6H7N3O2
Molecular Weight	153.14

Chemical Name in the Inventory and Synonyms	**1,4-Benzenediamine, N,N-diethyl-, sulfate** 4-amino-N,N-diethylaniline sulfate Diethylparamine
CAS Number	6065-27-6
Structural Formula	

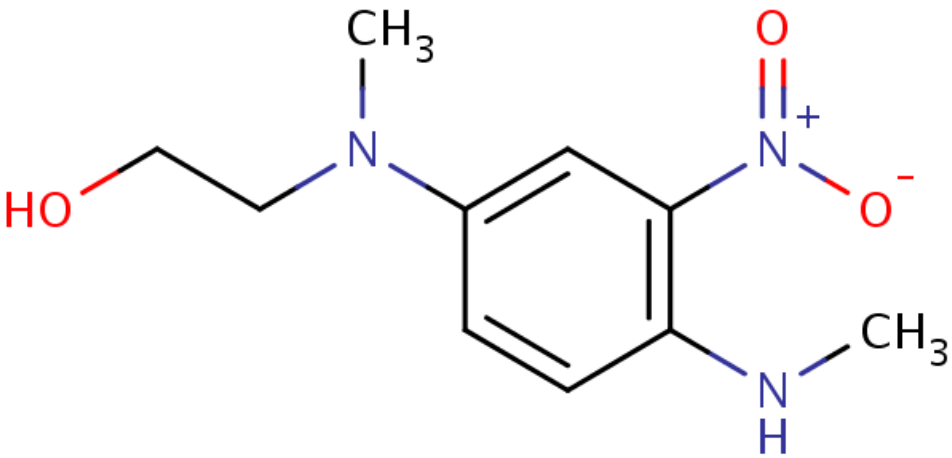
	
Molecular Formula	C10H16N2.xH2O4S
Molecular Weight	262.328

Chemical Name in the Inventory and Synonyms	**1,4-Benzenediamine, N,N-dimethyl-, sulfate** 4-amino-N,N-dimethylaniline sulfate CI 76076
CAS Number	6219-73-4
Structural Formula	

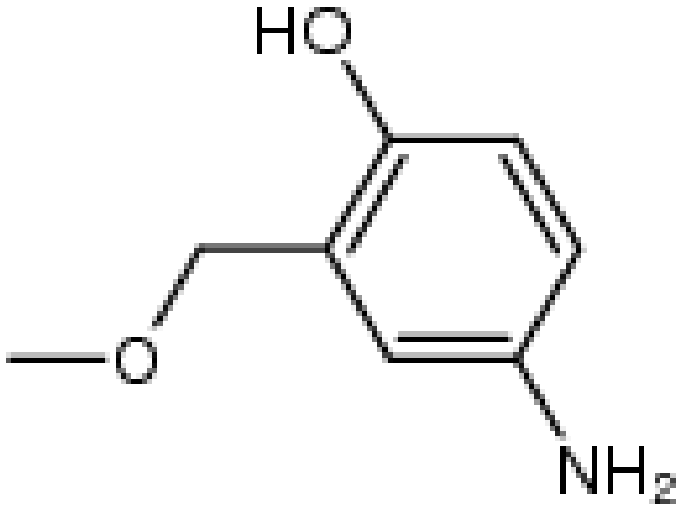


Molecular Formula	C8H12N2.xH2O4S
Molecular Weight	234.275

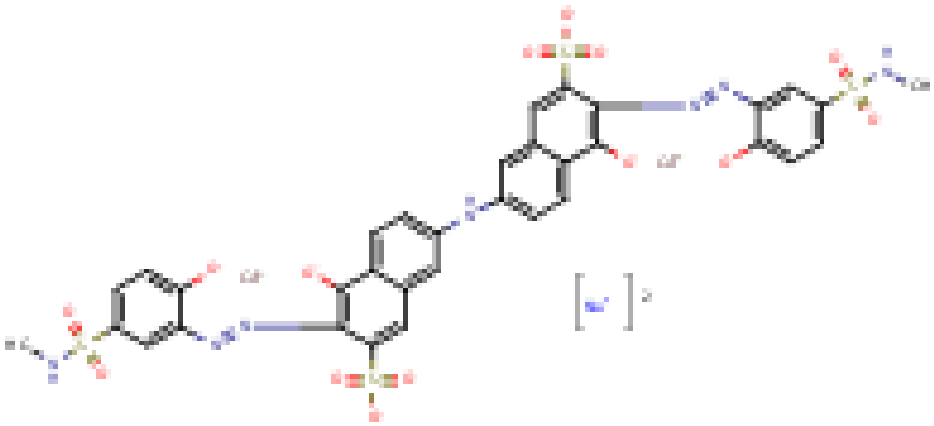
Chemical Name in the Inventory and Synonyms	**Ethanol, 2-[methyl[4-(methylamino)-3-nitrophenyl]amino]-** ethanol, 2-[N-methyl-4-(methylamino)-3-nitroanilino 2-[N-methyl-4-(methylamino)-3-nitroanilino]ethanol
CAS Number	10228-03-2
Structural Formula	

	
Molecular Formula	C10H15N3O3
Molecular Weight	225.247

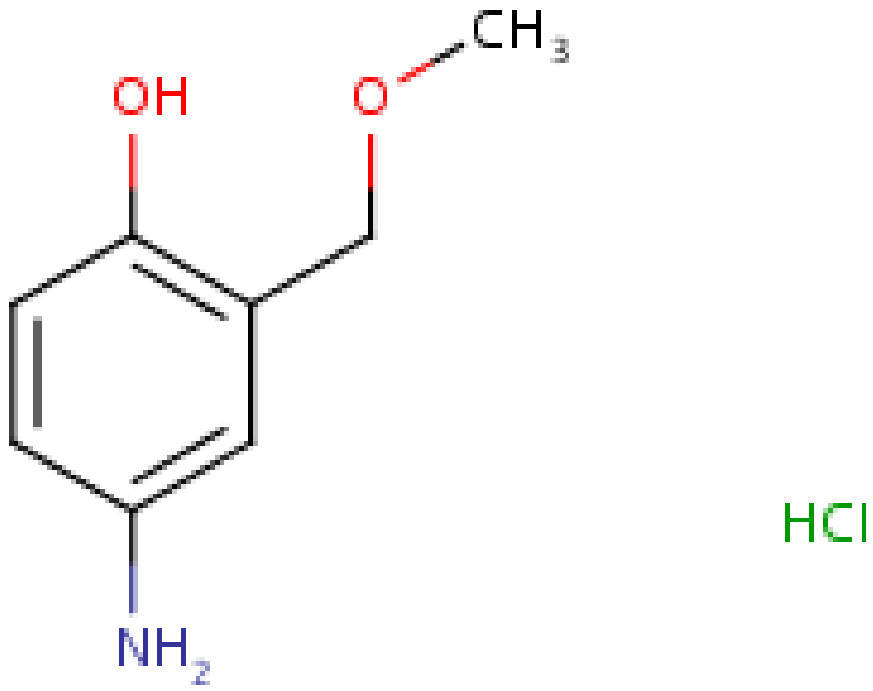
Chemical Name in the Inventory and Synonyms	**Phenol, 4-amino-2-(methoxymethyl)-** 2-(methoxymethyl)-4-aminophenol 2-(Methoxymethyl)-4-aminophenol 2-(Methoxymethyl)-4-aminophenol
CAS Number	29785-47-5
Structural Formula	

	
Molecular Formula	C8H11NO2
Molecular Weight	153.011

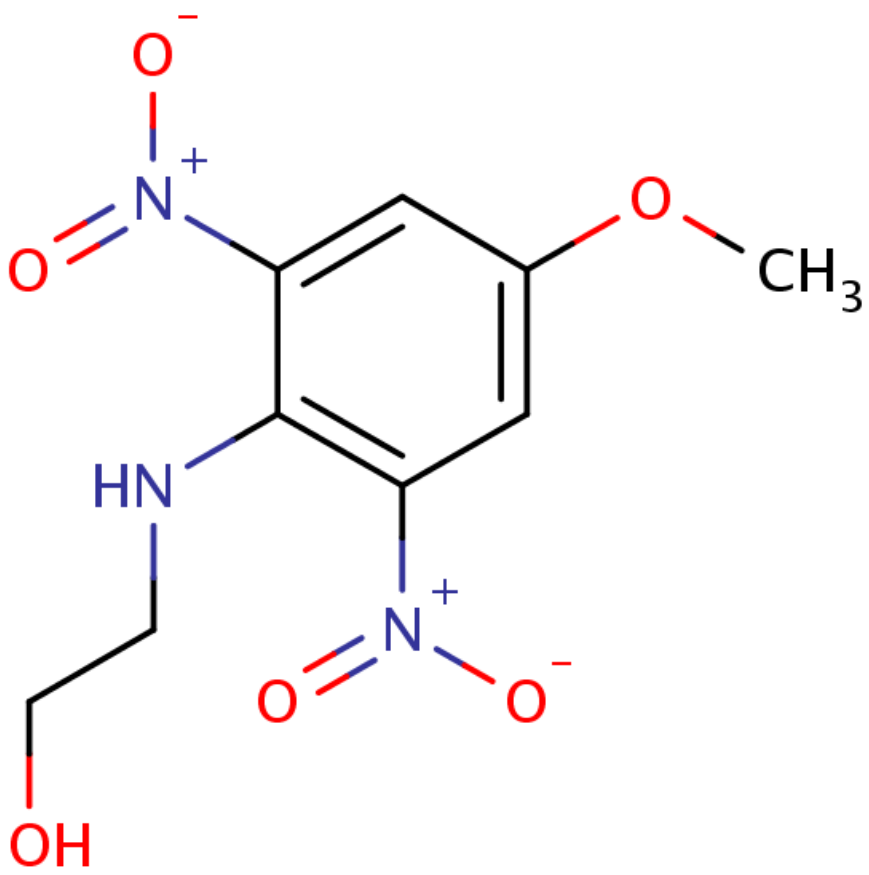
Chemical Name in the Inventory and Synonyms	**Cuprate(2-), [.mu.-[[7,7'-iminobis[4-hydroxy-3-[[2-hydroxy-5-[(methylamino)sulfonyl]phenyl]azo]-2-naphthalenesulfonato]](6-)]]di-, disodium** CI Direct Violet 48 CI 29125
CAS Number	37279-54-2
Structural Formula	

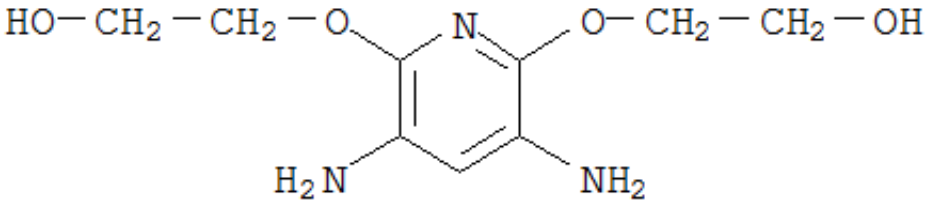
	
Molecular Formula	C34H23Cu2N7O14S4.2Na
Molecular Weight	1054.93

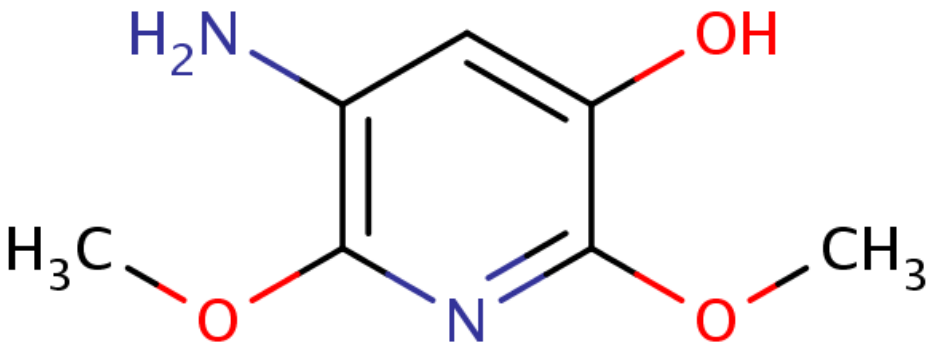
Chemical Name in the Inventory and Synonyms	**Phenol, 4-amino-2-(methoxymethyl)-, monohydrochloride** phenol, 4-amino-2-(methoxymethyl)-, hydrochloride (1:1)
CAS Number	135043-65-1
Structural Formula	

	
Molecular Formula	C8H11NO2.ClH
Molecular Weight	189.6408

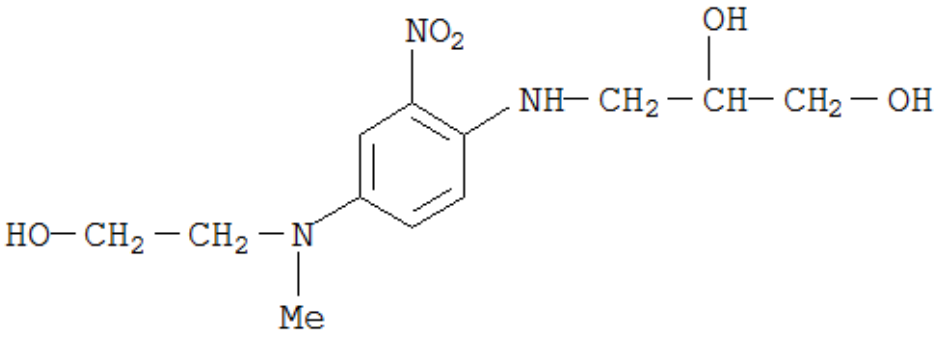
Chemical Name in the Inventory and Synonyms	**Ethanol, 2-[(4-methoxy-2,6-dinitrophenyl)amino]-** 2,6-dinitro-4-methoxy-N-(2-hydroxyethyl)aniline
CAS Number	122252-11-3
Structural Formula	

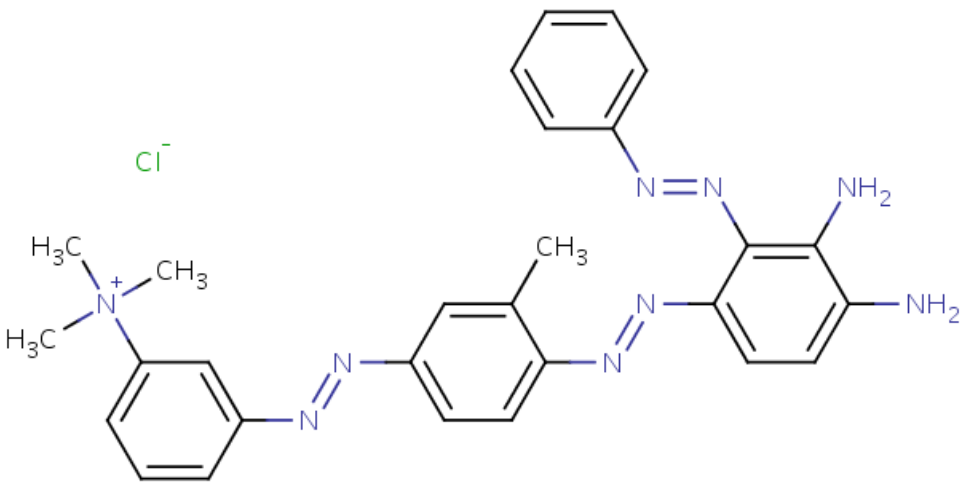
	
Molecular Formula	C9H11N3O6
Molecular Weight	257.2009

Chemical Name in the Inventory and Synonyms	**Ethanol, 2,2'-[(3,5-diamino-2,6-pyridinediyl)bis(oxy)]bis-** pyridine, 3,5-diamino-2,6-bis(2-hydroxyethoxy)-
CAS Number	117907-42-3
Structural Formula	
Molecular Formula	C9H15N3O4
Molecular Weight	

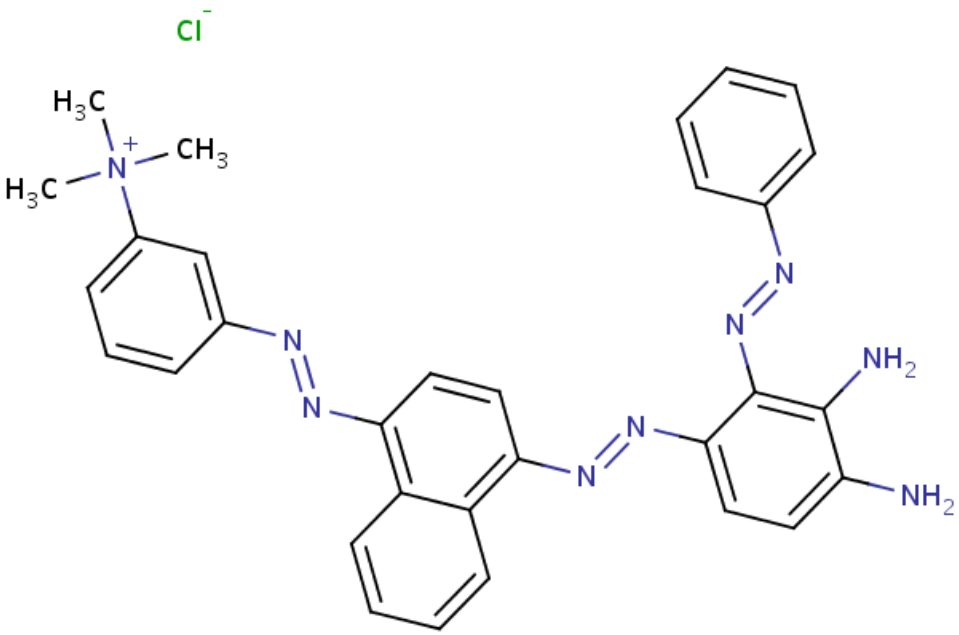
Chemical Name in the Inventory and Synonyms	**3-Pyridinol, 5-amino-2,6-dimethoxy-** 3-amino-5-hydroxy-2,6-dimethoxypyridine
CAS Number	104333-03-1
Structural Formula	
Molecular Formula	C7H10N2O3
Molecular Weight	170.167

Chemical Name in the Inventory and Synonyms	**1,2-Propanediol, 3-[[4-[(2-hydroxyethyl)methylamino]-2-nitrophenyl]amino]-** HC Blue No. 10
CAS Number	102767-27-1
Structural Formula	

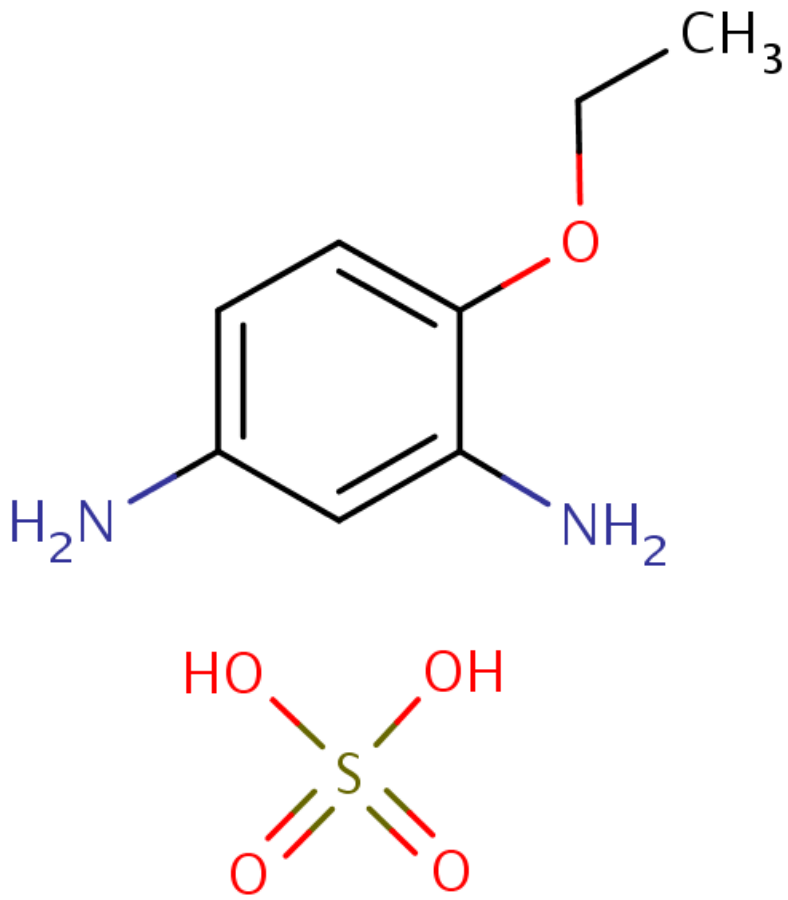
	
Molecular Formula	C12H19N3O5
Molecular Weight	285.011

Chemical Name in the Inventory and Synonyms	**Benzenaminium, 3-[[4-[[diamino(phenylazo)phenyl]azo]-2-methylphenyl]azo]-N,N,N-trimethyl-, chloride** HC Brown 2 3-[[4-[[diamino(phenylazo)phenyl]azo]-m-tolyl]azo]-N,N,N-trimethylanilinium chloride
CAS Number	83803-99-0
Structural Formula	

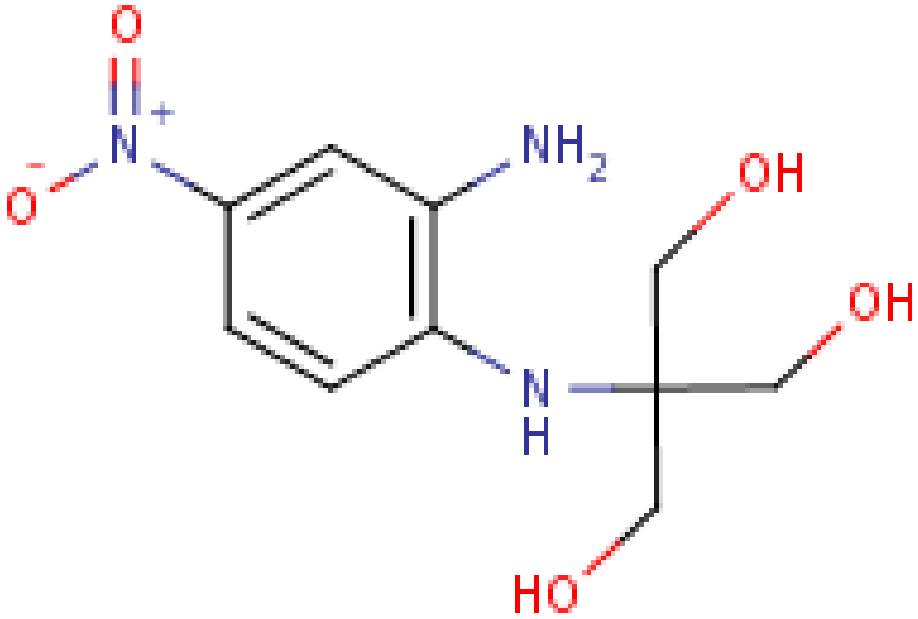
Molecular Formula	C28H30N9.Cl
Molecular Weight	528.061

Chemical Name in the Inventory and Synonyms	**Benzenaminium, 3-[[4-[[diamino(phenylazo)phenyl]azo]-1-naphthalenyl]azo]-N,N,N-trimethyl-, chloride** HC Brown 1 3-[[4-[[diamino(phenylazo)phenyl]azo]-1-naphthyl]azo]-N,N,N-trimethylanilinium chloride
CAS Number	83803-98-9
Structural Formula	
Molecular Formula	C31H30N9.Cl
Molecular Weight	564.094

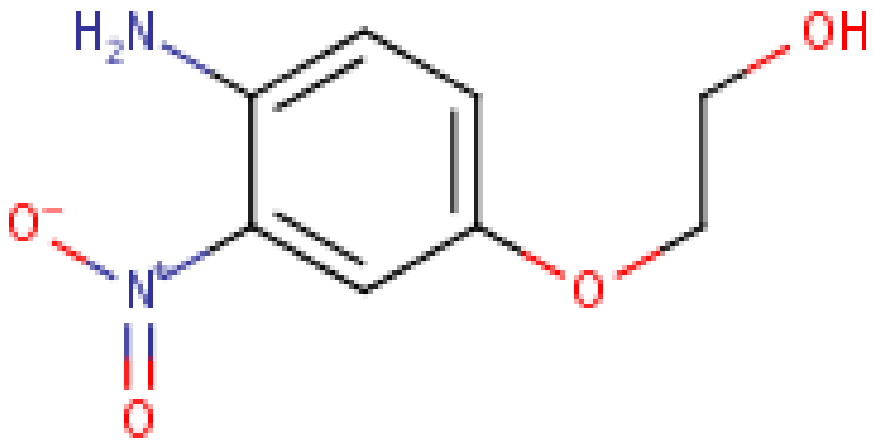
Chemical Name in the Inventory and Synonyms	**1,3-Benzenediamine, 4-ethoxy-, sulfate (1:1)** 4-ethoxy-m-phenylenediamine sulfate (INCI) 4-ethoxy-1,3-benzenediamine sulfate 4-ethoxybenzene-1,3-diammonium sulphate

CAS Number	68015-98-5
Structural Formula	
Molecular Formula	C8H12N2O.H2O4S
Molecular Weight	250.274

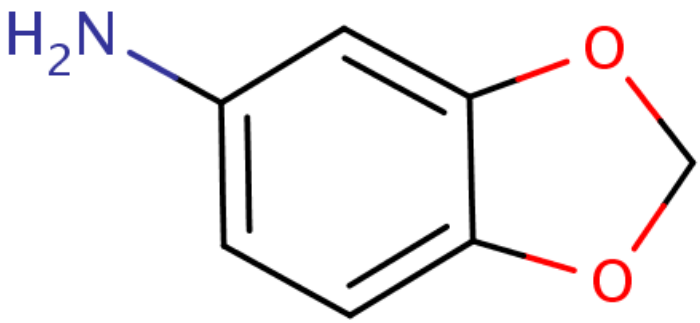
Chemical Name in the Inventory and Synonyms	**1,3-Propanediol, 2-[(2-amino-4-nitrophenyl)amino]-2-(hydroxymethyl)-** N-tris(hydroxymethyl)methyl-4-nitro-o-phenylenediamine 2-[(2-amino-4-nitrophenyl)amino]-2-(hydroxymethyl)propane-1,3-diol 1,3-Propanediol, 2-(2-amino-4-nitrophenyl)amino-2-(hydroxymethyl)- HC Yellow No. 3
CAS Number	56932-45-7
Structural Formula	

	
Molecular Formula	C10H15N3O5
Molecular Weight	257.2

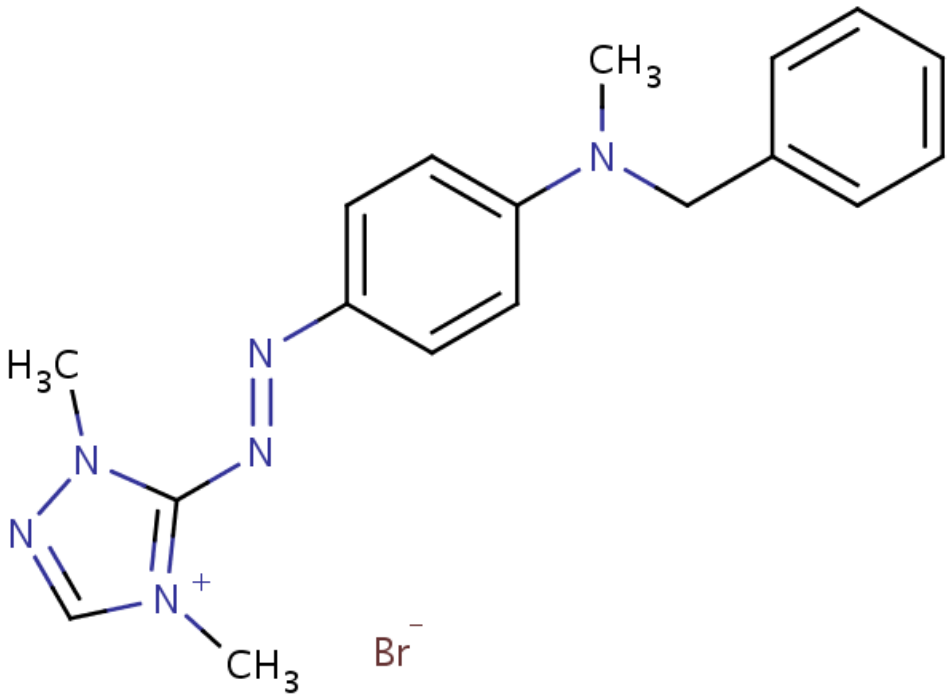
Chemical Name in the Inventory and Synonyms	**Ethanol, 2-(4-amino-3-nitrophenoxy)-** 2-(3-nitro-4-aminophenoxy)ethanol
CAS Number	50982-74-6
Structural Formula	

	
Molecular Formula	C8H10N2O4
Molecular Weight	198.177

Chemical Name in the Inventory and Synonyms	**1,3-Benzodioxol-5-amine** methylenedioxyaniline 1,2-(methylenedioxy)-4-aminobenzene
CAS Number	14268-66-7
Structural Formula	

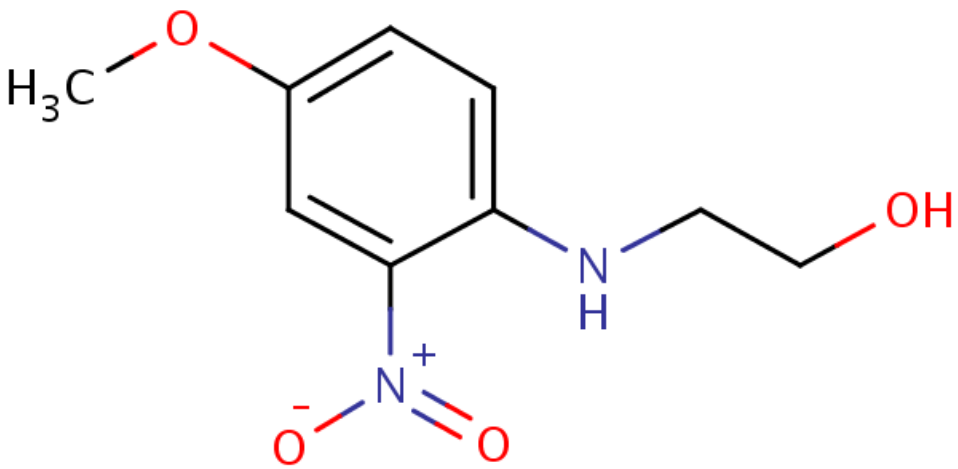
	
Molecular Formula	C7H7NO2
Molecular Weight	137.137

Chemical Name in the Inventory and Synonyms	**C.I. Basic Red 46** Synacril Red Anilan Red Astrazon Red Kayacryl Red Maxilon Red
CAS Number	12221-69-1
Structural Formula	

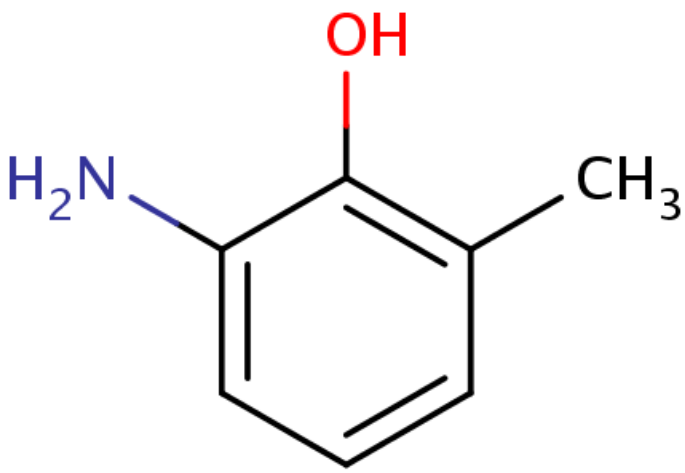
	
Molecular Formula	Unspecified
Molecular Weight	401.3099

Chemical Name in the Inventory and Synonyms	**1H-1,2,4-Triazolium, 1,2(or 1,4)-dimethyl-3(or 5)-[[4-[methyl(phenylmethyl)amino]phenyl]azo]-, bromide** 3(or5)-[[4-[benzylmethylamino]phenyl]azo]-1,2(or1,4)-dimethyl-1H-1,2,4-triazolium bromide Basic Red 46
CAS Number	89959-98-8
Structural Formula	

	No Structural Diagram Available
Molecular Formula	C18H21N6.Br
Molecular Weight	

Chemical Name in the Inventory and Synonyms	**Ethanol, 2-[(4-methoxy-2-nitrophenyl)amino]-** 2-[(2-nitro-4-methoxyphenyl)amino]ethanol
CAS Number	57524-53-5
Structural Formula	

Molecular Formula	C9H12N2O4
Molecular Weight	212.204

Chemical Name in the Inventory and Synonyms	**Phenol, 2-amino-6-methyl-** 6-amino-2-methylphenol 6-amino-o-cresol
CAS Number	17672-22-9
Structural Formula	
Molecular Formula	C7H9NO
Molecular Weight	123.1541

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