

# **Compendium of Safety Data Sheets for Research and Industrial Chemicals**

**Edited by**

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**Part II**

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## **SPECIAL NOTICE FROM THE EDITORS**

The information contained herein is based upon data drawn from the literature or experimentally determined and is believed to be accurate. Great care has been taken to assure the typing, editing and accuracy of the information contained in this **Compendium**. However, no warranty or representation is expressed or implied by the editors or the publisher regarding the accuracy of these data or the results to be obtained from the use thereof. This applies to all of the information herein and expressly to the information in the first aid, health hazards and shipping sections.

## Preface

There are many excellent compilations of chemical and physical data available as references. The same can be said of medically related reference books. Fewer references, however, are available as guides to safe usage, storage, cleanup and shipping regulations, and fewer yet that contain any information pertaining to selection of glove materials for personal protection against exposure to any but the most common of chemicals and solvents. It is the object of this **Compendium** to provide in a single source the most commonly sought and useful information for safety-oriented needs involving chemicals of both research and industry. Instead of having to search through multiple reference sources for this information, one can simply use this **Compendium**. The information herein is compiled from over fifty reference sources.

The utility of this **Compendium** has become even greater with the recent promulgation of the NIOSH Hazard Communication Rule. This ruling requires manufacturers, formulators, repackagers, distributors, and importers of hazardous chemicals or mixtures which contain as little as 1% of hazardous chemicals (and 0.1% of carcinogenic chemicals) to provide their employees with Material Safety Data Sheets (MSDSs). Most of the specific information in the MSDSs will be found in this **Compendium** for those compounds which are listed. The **Compendium** data sheets cannot be used as substitutes for MSDSs because information such as appropriate engineering controls, work practices and personal protective equipment are not included herein. However, all of the "searchable" information that is so time consuming -- and expensive -- to gather is incorporated in these **Compendium** data sheets.

The majority of the compounds in this **Compendium** are drawn from information compiled by the National Toxicology Program (NTP). The NTP was established as a U.S. Department of Health and Human Services cooperative effort to coordinate and provide information about potentially toxic chemicals to regulatory and research agencies and to strengthen the science base in toxicology. Chemicals for testing in NTP programs are screened and selected by a Chemical Selection Committee. Criteria for selection include potential for human exposure through use in manufacture, formulation and research. To these compounds the editors have added selected compounds of importance to chemical synthesis and research. The fact that most of these compounds in these volumes have also been chosen for study by the National Toxicology Program further enhances the utility of this **Compendium** by prioritizing many of the compounds that are suspected of being potentially hazardous chemicals. This does not mean that they are hazardous chemicals -- merely that they were chosen for study for one reason or another.

• These three volumes contain detailed information on 867 different chemicals. It

is anticipated that supplemental volumes containing information on additional chemicals will be published in future years.

As with any reference of this kind, information and regulations are rapidly changing, particularly regarding shipping. It is therefore wise to consult the latest government regulations before using the information herein as the final reference.

## **Acknowledgments**

The editors wish to express their appreciation to Charles E. Hudak, William S. Baillargeon, Carole Starr and Robin D. Smith for their diligent efforts in helping to prepare these data sheets and to Melody DeMoss for her patience in typing many of them. Special thanks are also extended to Virginia H. Keith who was invaluable in helping to produce the indexes and in preparing the manuscript for publication.

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**NTP PREFERRED NAME:** Dacarbazine

**Synonyms:**

5-(3,3-Dimethyl-1-triazenyl)-  
1H-imidazole-4-carboxamide  
5-(Dimethyltriazenyl)-  
imidazole-4-carboxamide

**CAS Registry Number:**

4342-03-4

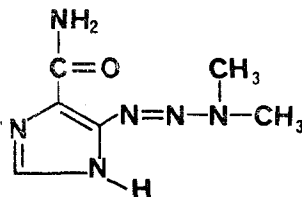
**NIOSH Registry Number:**

NI3950000

**Formula:**  $C_6H_{10}N_6O$

**Molecular Weight:** 182.18

**WLN:** T5M CNJ DVZ ENUNN1&1



**Physical Description:** Ivory microcrystalline substance.

**Melting Point:** 250-255°C (explodes) **Boiling Point:** Not available

**Density:** Not available **Specific Gravity:** Not available

**Flammability:** Not available **Stability:** Light sensitive; explosive decomposition occurs at 240-255°C; stable in neutral solutions in the absence of light.

**Flash Point:** Not available

**Reactivity:** Not available

**Solubility In:** **Water:** Not available **Acetone:** Not available

**DMSO:** Not available **Ether:** Not available

**Ethanol:** Not available **Benzene:** Not available

**Other Physical Data:** Not available

**D.O.T. Shipping Name:** Hazardous Substance, Solid, N.O.S.

**D.O.T. Identification Number:** NA9188

**D.O.T. Hazard Classification:** ORM-E

**Other Shipping Regulations:** None; no limit with passenger or cargo aircraft.

**Exceptions:** None. Specific Requirements, 173.1300 in Hazardous Materials Regulations of the Department of Transportation (1981).



NTP PREFERRED NAME: Dacarbazine

212

**Acute Hazards:** Toxic

**Symptoms:** Unknown

**Exposure Limits:** Not regulated

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**Skin Contact:** Flood all areas of body that have contacted the substance with water. Don't wait to remove contaminated clothing; do it under the water stream. Use soap to help assure removal. Isolate contaminated clothing when removed to prevent contact by others.

**Eye Contact:** Remove any contact lenses at once. Flush eyes well with copious quantities of water or normal saline for at least 20-30 minutes. Seek medical attention.

**Inhalation:** Leave contaminated area immediately; breathe fresh air. Proper respiratory protection must be supplied to any rescuers. If coughing, difficult breathing or any other symptoms develop, seek medical attention at once, even if symptoms develop many hours after exposure.

**Ingestion:** If convulsions are not present, give a glass or two of water or milk to dilute the substance. Assure that the person's airway is unobstructed and contact a hospital or poison center immediately for advice on whether or not to induce vomiting.

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**Storage Precautions:** Store in a cool, dry place or in a refrigerator. Protect from light.

**Spills and Leakage:** Dampen spilled material with alcohol to avoid dust, then transfer material to a suitable container. Use absorbent paper dampened with alcohol to pick up remaining material. Wash surfaces well with soap and water. Seal all wastes in vapor-tight plastic bags for eventual disposal.

**Suggested Gloves:** Not available

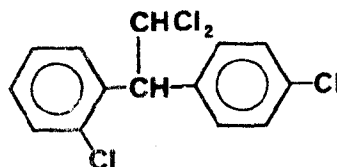
**Uses:** Antineoplastic

**Additional Reference Sources:**

Dangerous Properties of Industrial Materials, N. I. Sax, 5th Ed., p. 615 (1979), Van Nostrand Reinhold.

Merck Index, M. Windholz et al, 9th Ed., p. 368 (1976), Merck.

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Y**NTP PREFERRED NAME:** o,p'-DDD**Synonyms:**1,1-Dichloro-2-  
(o-chlorophenyl)-2-  
(p-chlorophenyl)-  
ethane**CAS Registry Number:**  
53-19-0**NIOSH Registry Number:**  
KH7880000**Formula:**  $C_{14}H_{10}Cl_4$ **Molecular Weight:** 320.05**WLN:** GGYR BG&R DGP  
H  
Y  
S  
I  
C  
A  
L  
  
P  
R  
O  
P  
E  
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E  
S**Physical Description:** Colorless powder**Melting Point:** 77-78°C**Boiling Point:** Not available**Density:** Not available**Specific Gravity:** Not available**Flammability:** Not available**Stability:** Stable under normal  
laboratory storage  
conditions.**Flash Point:** Not available**Reactivity:** Dehydrohalogenates with strong alkalis.**Solubility In:**    **Water:** <1 mg/mL at 24°C    **Acetone:** ≥10 mg/mL at 24°C                  **DMSO:** ≥10 mg/mL at 24°C    **Ether:** Not available                  **Ethanol:** ≥10 mg/mL at 24°C    **Benzene:** Not available**Other Physical Data:** Soluble in isooctane and carbon tetrachloride.S  
H  
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N  
G**D.O.T. Shipping Name:** Insecticide, dry, N.O.S.**D.O.T. Identification Number:** NA2588**D.O.T. Hazard Classification:** Poison B**Other Shipping Regulations:** Poison B Label required. Passenger aircraft  
limit is 50 lbs.; cargo aircraft limit is 200 lbs.**Exceptions:** None. Specific Requirements, 173.1300 in Hazardous Materials  
Regulations of the Department of Transportation (1981).

**Acute Hazards:** Toxic by ingestion, inhalation and skin absorption.  
Hazardous decomposition products.

**Symptoms:** Nausea, vomiting, and irritation of eyes.

**Exposure Limits:** Not regulated

**Skin Contact:** Flood all areas of body that have contacted the substance with water. Don't wait to remove contaminated clothing; do it under the water stream. Use soap to help assure removal. Isolate contaminated clothing when removed to prevent contact by others.

**Eye Contact:** Remove any contact lenses at once. Flush eyes well with copious quantities of water or normal saline for at least 20-30 minutes. Seek medical attention.

**Inhalation:** Leave contaminated area immediately; breathe fresh air. Proper respiratory protection must be supplied to any rescuers. If coughing, difficult breathing or any other symptoms develop, seek medical attention at once, even if symptoms develop many hours after exposure.

**Ingestion:** If convulsions are not present, give a glass or two of water or milk to dilute the substance. Assure that the person's airway is unobstructed and contact a hospital or poison center immediately for advice on whether or not to induce vomiting.

**Storage Precautions:** Store in a cool, dry place. Protect from alkalis.

**Spills and Leakage:** Dampen spilled material with alcohol to avoid dust, then transfer material to a suitable container. Use absorbent paper dampened with alcohol to pick up remaining material. Wash surfaces well with soap and water. Seal all wastes in vapor-tight plastic bags for eventual disposal.

**Suggested Gloves:** Not available

**Uses:** Antineoplastic agent, insecticide.

**Additional Reference Sources:**

Merck Index, M. Windholz et al, 9th Ed., p. 808 (1976), Merck.

Dangerous Properties of Industrial Materials, N. I. Sax, 5th Ed., p. 534 (1979), Van Nostrand Reinhold.

Dictionary of Organic Compounds, J. Buckingham, 5th Ed., p.2717 (1982), Chapman and Hall.

**NTP PREFERRED NAME:** p,p'-DDE

**Synonyms:**

1,1-Dichloro-2,2-bis-(p-chlorophenyl)ethylene  
1,1'-Dichloroethylidene bis-(4-chlorobenzene)

**CAS Registry Number:**

72-55-9

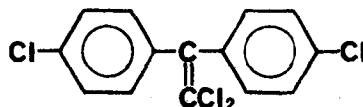
**NIOSH Registry Number:**

KV9450000

**Formula:** C<sub>14</sub>H<sub>8</sub>Cl<sub>4</sub>

**Molecular Weight:** 318.03

**WLN:** GYGUYR XG&R XG



**Physical Description:** Colorless crystals

**Melting Point:** 88-90°C

**Boiling Point:** 316.5°C

**Density:** Not available

**Specific Gravity:** Not available

**Flammability:** Not available

**Stability:** Stable under normal laboratory storage conditions.

**Flash Point:** Not available

**Reactivity:** May be oxidized to p,p'-dichlorodibenzophenone when catalyzed by UV light.

**Solubility In:** Water: <1 mg/mL at 21°C

Acetone: Soluble

DMSO: ≥10 mg/mL at 21°C

Ether: Not available

Ethanol: ≥10 mg/mL at 21°C

Benzene: Not available

**Other Physical Data:** Stable to concentrated H<sub>2</sub>SO<sub>4</sub>.

**D.O.T. Shipping Name:** Insecticide, dry, N.O.S.

**D.O.T. Identification Number:** NA2588

**D.O.T. Hazard Classification:** Poison B

**Other Shipping Regulations:** Poison B Label required. Passenger aircraft limit is 50 lbs.; cargo aircraft limit is 200 lbs.

**Exceptions:** None. Specific Requirements, 173.1300 in Hazardous Materials Regulations of the Department of Transportation (1981).

**Acute Hazards:** Toxic by ingestion and skin absorption; mild irritant.

**Symptoms:** Nausea and vomiting; irritation of eyes. Chronic symptoms include hepatic damage, CNS degeneration, agranulocytosis, dermatitis, weakness, convulsions, coma and death.

**Exposure Limits:** Not regulated

**Skin Contact:** Flood all areas of body that have contacted the substance with water. Don't wait to remove contaminated clothing; do it under the water stream. Use soap to help assure removal. Isolate contaminated clothing when removed to prevent contact by others.

**Eye Contact:** Remove any contact lenses at once. Flush eyes well with copious quantities of water or normal saline for at least 20-30 minutes. Seek medical attention.

**Inhalation:** Leave contaminated area immediately; breathe fresh air. Proper respiratory protection must be supplied to any rescuers. If coughing, difficult breathing or any other symptoms develop, seek medical attention at once, even if symptoms develop many hours after exposure.

**Ingestion:** If convulsions are not present, give a glass or two of water or milk to dilute the substance. Assure that the person's airway is unobstructed and contact a hospital or poison center immediately for advice on whether or not to induce vomiting.

**Storage Precautions:** Store in a cool, dry place or in a refrigerator. Protect from light.

**Spills and Leakage:** Dampen spilled material with alcohol to avoid dust, then transfer material to a suitable container. Use absorbent paper dampened with alcohol to pick up remaining material. Wash surfaces well with soap and water. Seal all wastes in vapor-tight plastic bags for eventual disposal.

**Suggested Gloves:** Not available

**Uses:** Insecticide

**Additional Reference Sources:**

Dangerous Properties of Industrial Materials, N. I. Sax, 5th Ed., p. 558 (1979), Van Nostrand Reinhold.

Dictionary of Organic Compounds, J. Buckingham, 5th Ed., p.1713 (1982), Chapman and Hall.

IARC Monographs, Vol. 5, p. 83-124 (1974). World Health Organization.

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Y**NTP PREFERRED NAME:** Decabromodiphenyl oxide**Synonyms:**

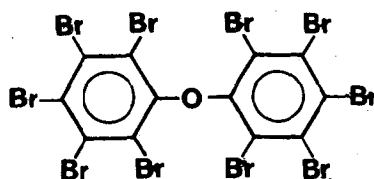
1,1'-Oxybis(2,3,4,5,6-  
pentabromobenzene)  
Decabromodiphenyl ether  
Pentabromophenyl ether

**CAS Registry Number:**

1163-19-5

**NIOSH Registry Number:**

KN3525000

**Formula:** C<sub>12</sub>Br<sub>10</sub>O**Molecular Weight:** 959.17**WLN:** ER BE CE DE EE FOR BE CE DE EE FEP  
H  
Y  
S  
I  
C  
A  
LP  
R  
O  
P  
E  
R  
T  
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S**Physical Description:** Colorless crystalline powder.**Melting Point:** 304°C**Boiling Point:** Not available**Density:** Not available**Specific Gravity:** Not available**Flammability:** Non-flammable**Stability:** Stable under normal laboratory storage conditions.**Flash Point:** Not available**Reactivity:** Not available**Solubility In:** Water: <1 mg/mL**Acetone:** Not available

DMSO: 1-10 mg/mL

**Ether:** Not available

Ethanol: Not available

**Benzene:** Not available**Other Physical Data:** Not availableS  
H  
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G**D.O.T. Shipping Name:** Hazardous Substance, Solid, N.O.S.**D.O.T. Identification Number:** NA9188**D.O.T. Hazard Classification:** ORM-E**Other Shipping Regulations:** None; no limit with passenger or cargo aircraft.**Exceptions:** None. Specific Requirements, 173.1300 in Hazardous Materials Regulations of the Department of Transportation (1981).

<p><b>Acute Hazards:</b> Toxic, irritant</p> <p><b>Symptoms:</b> Mild eye irritation.</p> <p><b>Exposure Limits:</b> Not regulated</p>	H E A L T H  H A Z A R D S
<p><b>Skin Contact:</b> Flood all areas of body that have contacted the substance with water. Don't wait to remove contaminated clothing; do it under the water stream. Use soap to help assure removal. Isolate contaminated clothing when removed to prevent contact by others.</p> <p><b>Eye Contact:</b> Remove any contact lenses at once. Flush eyes well with copious quantities of water or normal saline for at least 20-30 minutes. Seek medical attention.</p> <p><b>Inhalation:</b> Leave contaminated area immediately; breathe fresh air. Proper respiratory protection must be supplied to any rescuers. If coughing, difficult breathing or any other symptoms develop, seek medical attention at once, even if symptoms develop many hours after exposure.</p> <p><b>Ingestion:</b> If convulsions are not present, give a glass or two of water or milk to dilute the substance. Assure that the person's airway is unobstructed and contact a hospital or poison center immediately for advice on whether or not to induce vomiting.</p>	F I R S T  A I D
<p><b>Storage Precautions:</b> Store in a cool, dry place or in a refrigerator.</p> <p><b>Spills and Leakage:</b> Dampen spilled material with toluene to avoid dust, then transfer material to a suitable container. Use absorbent paper dampened with toluene to pick up remaining material. Wash surfaces well with soap and water. Seal all wastes in vapor-tight plastic bags for eventual disposal.</p> <p><b>Suggested Gloves:</b> Not available</p> <p><b>Uses:</b> Organic synthesis</p> <p><b>Additional Reference Sources:</b> <u>Registry of Toxic Effects of Chemical Substances</u>, R. Lewis (1979), NIOSH. <u>Aldrich Catalog Handbook of Fine Chemicals</u>, p. 905, (1982-3), Aldrich Chemical Co.</p>	A D D I T I O N A L  I N F O R M A T I O N

**NTP PREFERRED NAME:** n-Decyl methacrylate

**Synonyms:**

Decyl methacrylate

IDENTITY

**CAS Registry Number:**

3179-47-3

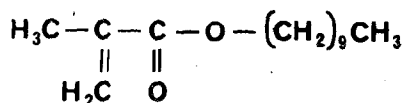
**NIOSH Registry Number:**

Not available

**Formula:**  $C_{14}H_{26}O_2$

**Molecular Weight:** 226.36

**WLN:** 100VY1&U1



PHYSICAL PROPERTIES

**Physical Description:** Light tan liquid.

**Melting Point:** Not available

**Boiling Point:** Not available

**Density:** Not available

**Specific Gravity:** Not available

**Flammability:** Probably combustible

**Stability:** Sensitive to light.

**Flash Point:** Not available

**Reactivity:** Not available

**Solubility In:** Water: Insoluble

Acetone: Not available

DMSO:  $\geq 10$  mg/mL

Ether: Not available

Ethanol:  $\geq 10$  mg/mL

Benzene: Not available

**Other Physical Data:** Not available

SHIPPING

**D.O.T. Shipping Name:** Hazardous Substance, Liquid, N.O.S.

**D.O.T. Identification Number:** NA9183

**D.O.T. Hazard Classification:** ORM-E

**Other Shipping Regulations:** None; no limit with passenger or cargo aircraft.

**Exceptions:** None. Specific Requirements, 173.1300 in Hazardous Materials Regulations of the Department of Transportation (1981).



**Acute Hazards:** Unknown

**Symptoms:** Unknown

**Exposure Limits:** Not regulated

**Skin Contact:** Flood all areas of body that have contacted the substance with water. Don't wait to remove contaminated clothing; do it under the water stream. Use soap to help assure removal. Isolate contaminated clothing when removed to prevent contact by others.

**Eye Contact:** Remove any contact lenses at once. Flush eyes well with copious quantities of water or normal saline for at least 20-30 minutes. Seek medical attention.

**Inhalation:** Leave contaminated area immediately; breathe fresh air. Proper respiratory protection must be supplied to any rescuers. If coughing, difficult breathing or any other symptoms develop, seek medical attention at once, even if symptoms develop many hours after exposure.

**Ingestion:** If convulsions are not present, give a glass or two of water or milk to dilute the substance. Assure that the person's airway is unobstructed and contact a hospital or poison center immediately for advice on whether or not to induce vomiting.

**Storage Precautions:** Store in a cool, dry place or in a refrigerator.

**Spills and Leakage:** Use absorbent paper to pick up spilled material. Follow by washing surfaces well first with alcohol, then with soap and water. Seal all wastes in vapor-tight plastic bags for eventual disposal.

**Suggested Gloves:** Not available

**Uses:** Organic synthesis

**Additional Reference Sources:**

TSCA Chemical Substances Inventory, (May 1979), U.S. EPA.