

**CENTER FOR NUCLEAR WASTE
REGULATORY ANALYSES**

ADMINISTRATIVE PROCEDURE

Proc. AP-016

Revision 0

Page 1 of 4

Title Hazard Communication Program

EFFECTIVITY AND APPROVAL

Revision 0 of this procedure became effective on February 10, 1998. This procedure consists of the pages and changes listed below.

<u>Page No.</u>	<u>Change</u>	<u>Date Effective</u>
All	0	2/10/98

SUPERSEDED

Supersedes Procedure No. None

Approvals

Written By

Darrell Dunn

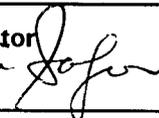


Date

2/9/98

Cognizant Director

Budhi Sagar



Date

2/5/98

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AP-016
HAZARD COMMUNICATION PROGRAM

Hazard communication provides information to employees regarding hazardous chemicals in the work area. OSHA standards (29 CFR 1910.1200) require that chemical hazards and information concerning chemical hazards in the workplace be transmitted to employees.

1. RESPONSIBILITIES

- a. Management of the hazard communication program for this cost center: Darrell S. Dunn, Research Engineer, Building 57, 522-6090.
- b. Maintenance of the chemical inventory and Material Safety Data Sheets (MSDS): Darrell S. Dunn.
- c. Training and information: Supervisor.

2. METHODS OF INFORMATION

- a. Employees will be informed of chemical hazards during non-routine tasks by the following method(s): supervisors' verbal or written instructions, and reviewing MSDS.
- b. Employees will be informed of the hazards of chemicals in unlabeled pipes by the following method(s): supervisors' verbal or written warning, warning signs, and reviewing MSDS.
- c. Contractors will be informed of the hazards of chemicals by the following method(s): Center for Nuclear Waste Regulatory Analyses (CNWRA) supervisors' verbal or written instructions, warning signs, and reviewing MSDS.
- d. Contractors will be informed of measures to protect their employees by the following method(s): CNWRA supervisors' verbal or written instructions, warning signs, and reviewing MSDS.

3. LABELING AND OTHER FORMS OF WARNING

- a. All hazardous chemical containers will be labelled, tagged, or marked with required information listed in 3b.
- b. Labels, tags, and markings will include the identity of the hazardous chemical, appropriate hazard warnings, and the name and address of the chemical manufacturer, importer, or other responsible party.

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- c. Containers without appropriate forms of warning will be properly labeled. The receiving cost center or user will take action to return the material, obtain a label from the manufacturer, or purchase a label.
- d. Portable containers such as those used to transfer or measure chemicals do not have to be labeled if intended for brief, temporary use (on that shift). Unlabeled containers will not be left unattended under any circumstances.

4. MATERIAL SAFETY DATA SHEETS

- a. MSDS will be available to employees before or upon the arrival of hazardous chemicals at the workplace.
- b. MSDS are kept in Room L106 and L111 of Building 57.

5. EMPLOYEE TRAINING AND INFORMATION

- a. Employees who work with or around hazardous chemicals will be properly trained. Training will be conducted at the time of an employee's initial assignment and whenever a new chemical is introduced into the work area which poses a significantly greater hazard or a different type of hazard.
- b. Employees will receive training in the following:
 - 1. Methods to detect hazardous chemicals.
 - 2. Physical and health hazards of chemicals. Reference MSDS.
 - 3. Employee's protection measures.
 - 4. Details of the hazard communication program.
- c. Employees will be provided the following information:
 - 1. Operations where hazardous chemicals are present.
 - 2. Location and availability of the written hazard communication program.
 - 3. Location and availability of the chemical inventory list.
 - 4. Location and availability of MSDS.

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6. RECORD KEEPING

- a. Hazard communication programs will be updated annually or as new hazards enter the workplace.
- b. Employee training and information sheets will be forwarded to the Division 20 hazard communication representatives.
- c. A record of individual employee training will be maintained with the hazard communication program in Division 20.
- d. A copy of all hazard communication programs (as updated) will be forwarded to the Southwest Research Institute Safety Department.

APPENDIX A

CNWRA
Center for Nuclear Waste
Regulatory Analyses Laboratory

Building 57, Chemical Inventory

NAME	FORMULA	COMPANY
Acetic Acid, Glacial	(CH ₃ COOH) w/w	Fisher
Acetone	CH ₃ COCH ₃	Fisher
Acetonitrile		Fisher
Acid Neutralizer	Spill-X-C, Trademark	Wormald U.S. Inc.
Acridine Orange	C ₁₇ H ₂₀ ClN ₃	Fisher
Acrylamide	CH ₂ CHCONH ₂	Fisher
Agar, Bacto		DIFCO
Agar, EMB		DIFCO
Agar, granulated		DIFCO
Agar, R2A		DIFCO
Agar, Marine 2216		DIFCO
Agar, Nutrient		DIFCO
L-Alanine	C ₃ H ₇ NO ₂	Fisher
Aluminum Metal (finest powder)	Al	Fisher
Aluminum Metal (powder)	Al	Mallinckrodt
Aluminum Nitrate	Al(NO ₃) ₃ ·9H ₂ O	Fisher
Aluminum Ref. Soln	1000 ppm Al in 5% HCl	Fisher
Aluminum Standard	1000 ppm Al	Mallinckrodt
1-Amino-2-Naphthol-4-Sulfonic Acid OR	C ₁₀ H ₉ NO ₄ S	Mallinckrodt
Ammonium Chloride	NH ₄ Cl	Fisher
Ammonium Hydroxide	NH ₄ OH (~14.8 N)	Fisher

NAME	FORMULA	COMPANY
Ammonium Metavanadate	NH_4VO_3	Aldrich
Ammonium Molybdate	$(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$	Fisher
Ammonium Nitrate	NH_4NO_3	Fisher and Mallinckrodt
Ammonium Oxylate, monohydrate	$(\text{NH}_4)_2\text{C}_2\text{O}_4 \cdot \text{H}_2\text{O}$	Fisher
Ammonium Phosphate	$(\text{NH}_4)_2\text{HPO}_4$	LabChem
Ammonium Persulfate		Fisher
Ammonium Sulfate	$(\text{NH}_4)_2\text{SO}_4$	Fisher
Ammonium Thiocyanate, 0.1 N Volumetric Soln.	$\text{C}_1\text{H}_4\text{N}_2\text{S}_1$	J. T. Baker
Amyl Acetate	$\text{C}_7\text{H}_{14}\text{O}_2$	Fisher
L-Arginine hydrochloride	$\text{C}_6\text{H}_{14}\text{N}_4\text{O}_2 \text{ Hcl}$	
Arsenazo III	$\text{C}_{22}\text{H}_{18}\text{As}_2\text{N}_4\text{O}_{14}\text{S}_2$	Aldrich
L-Ascorbic Acid	$\text{CH}_2\text{OHCHOH}[\text{CHCOH}:\text{COHCOO}]$	Fisher
Bacto peptone		DIFCO
Barium Chloride Dihydrate	$\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$	Fisher
Barium Nitrate	$\text{Ba}(\text{NO}_3)_2$	Fisher
Benzene	C_6H_6	Fisher
Benzopurpurin 4B	$\text{C}_{34}\text{H}_{26}\text{N}_6\text{Na}_2\text{O}_6\text{S}_2$	Kodak
Benzotriazole	$\text{C}_6\text{H}_4\text{NHN}:\text{N}$	Fisher
Bismuth Standard Soln.	1000 ppm Bi in HNO_3	Fisher
Borate Buffer		Ricca
Borax (Sodium tetra-Borate Decahydrate)	$(\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O})$	NBS
Boric Acid	H_3BO_3	Fisher
1,1,2,2-tetra-Bromoethane	$\text{C}_2\text{H}_2\text{Br}_4$	Kodak and Mallinckrodt

NAME	FORMULA	COMPANY
Bromoform	CHBr_3	Fisher
2-Butyne-1,4, Diol 99%	$\text{C}_4\text{H}_6\text{O}_2$	Aldrich
Cadmium Chloride	$\text{CdCl}_2 \cdot 2.5\text{H}_2\text{O}$	Analytical
		Scientific
Calcium Acetate	$\text{Ca}(\text{CH}_3\text{COO})_2 \cdot \text{H}_2\text{O}$	Fisher
Calcium Chloride Dihydrate	$\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$	Fisher and Mallinckrodt
Calcium Ionic Strength Adjustor	4M KCl	Orion
Calcium Nitrate	$\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$	Fisher and Mallinckrodt
Calcium Ref. Soln.	1000 ppm Ca	Fisher, Ricca, and Orion
Calcium Sulfate (Anhydrous)		see Drierite
Calcium Sulfate (powder)	$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	Mallinckrodt
Carbon Tetrachloride	CCl_4	Mallinckrodt
Casamino acid		DIFCO
Caustic Neutralizer	Spill-X-C, Trademark	Wormold U.S. Inc.
Ceric Sulfate Soln., N/10	$\text{Ce}(\text{SO}_4)_2$	Fisher
Cerium Nitrate Hexahydrate	$\text{Ce}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$	Aldrich
Cesium Chloride	CsCl	Fisher
Cesium Standard	1000 ppm Cs	Ricca and Fisher
Cesium Standard	1003 ppm Cs	SPEX
Chloride Ionic Strength Adjustor	5M NaNO_3	Orion
Chloride Standard	1000 ppm Cl^-	Orion
Chromium (III) Oxide	Cr_2O_3	Johnson Matthey
Chromic Chloride	$\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$	Fisher

NAME	FORMULA	COMPANY
Chloramine T	$\text{CH}_3\text{C}_6\text{H}_4\text{-4-SO}_2\text{NCINa } 3\text{H}_2\text{O}$	EM chemicals
Cobalt (II) Sulfate	$\text{CoSO}_4 \cdot 7\text{H}_2\text{O}$	Fisher
Copper Ref. Standard	1000 ppm Cu	Fisher
Copper(I) oxide	Cu_2O	Johnson Matthey
Copper(II) oxide	CuO	Johnson Matthey
Copper (II) carbonate	$\text{Cu}_2(\text{OH})_2\text{CO}_3$	Johnson Matthey
Crystal Violet	--	Fisher
Cuprous Chloride	$\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$	Fisher
Cupric Chloride	$\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$	Fisher
Cupric Nitrate	$\text{Cu}(\text{NO}_3)_2 \cdot 2.5\text{H}_2\text{O}$	Mallinckrodt
Cupric Sulfate	CuSO_4	Fisher
Cyclohexane	C_6H_{12}	Sigma
1,2-Cyclohexylene-dinitrile tetra-acetic Acid	$\text{C}_6\text{H}_{10}(\text{N}(\text{CH}_2\text{CO}_2\text{H})_2)_2 \cdot \text{H}_2\text{O}$	Fisher
Dextrose	$\text{C}_6\text{H}_{12}\text{O}_6$	DIFCO
Diethylenetriamine Pentaacetic Acid (99%)	$\text{C}_{14}\text{H}_{23}\text{O}_{18}$	Mallinckrodt
N,N-Diethyl-p-Phenylene diamine Oxalate	$((\text{C}_2\text{H}_5)_2\text{NC}_6\text{H}_4\text{NH}_2)_2(\text{COOH})_2$	Fisher and Kodak
N,N-Dimethyl Formamide	$\text{C}_3\text{H}_7\text{NO}$	Fisher and Mallinckrodt
Disodium Ethylenediamine Tetraacetate (EDTA)	$\text{Na}_2\text{C}_{18}\text{H}_{14}\text{O}_8\text{N}_2 \cdot 2\text{H}_2\text{O}$	Fisher
Disodium Hydrogen Phosphate	Na_2HPO_4	NBS Standard
Disodium Tetraborate Anhydrous	$\text{Na}_2\text{B}_4\text{O}_7$	EM
Dowex Anion Exchange Resin (Analytical Grade)	100-200 Mesh, Cl^- form	Bio-Rad
Dowex Cation Exchange Resin	100-200 Mesh, H^+ form	Bio-Rad

NAME	FORMULA	COMPANY
Drierite (Anhydrous)	CaSO ₄	W.A. Hammond
Eriochrome Cyanine R	C ₂₃ H ₁₅ Na ₃ O ₉ S	Fluka Chemie AG
Ethylene Glycol	HOCH ₂ CH ₂ OH	Fisher
Ferric Chloride	FeCl ₃ ·6H ₂ O	Fisher
Ferric Oxide		see Iron (III) Oxide
Ferrous Ammonium Sulfate	Fe(NH ₄) ₂ (SO ₄) ₂ ·6H ₂ O	Fisher
Ferric Sulfate, 4-Hydrate Reagent (powder)	Fe(SO ₄) ₃ ·4H ₂ O	Kodak
Ferrous sulfide	FeS	Johnson Matthey
Ferrous sulfide	FeS ₂	Johnson Matthey
Ferroso Ferric Oxide	Fe ₃ O ₄	Johnson Matthey
Ferrrous Chloride	FeCl ₂ ·4H ₂ O	Fisher
Fisher Oil bath		Fisher
D-Gluconic Acid, calcium salt, 99%	{HOCH ₂ [CH(OH)] ₄ CO ₂ } ₂ Ca	Aldrich
L-(+)-Glutamic Acid	HOOCCHNH ₂ CH ₂ CH ₂ COOH	Fisher
Gelatin		DIFCO
Glycerol	HOCH ₂ CHOHCH ₂ OH	J.T. Baker
Gum Xanthan		Sigma
Hydrazine Dihydrochloride	H ₂ NNH ₂ ·2HCl	Aldrich
Hydrazine Sulfate	H ₂ NNH ₂ ·H ₂ SO ₄	Aldrich
Hydrochloric Acid (conc.)	HCl (~12.1M)	Fisher
Hydrochloric Acid, 36.5-38%	HCl	J.T. Baker
Hydrofluoric Acid, 49%	HF	Fisher
Hydrogen Peroxide, 30%	H ₂ O ₂	Fisher
Hydrogen Peroxide, 50%	H ₂ O ₂	Fisher

NAME	FORMULA	COMPANY
8-Hydroxy-quinoline	$\text{HOC}_9\text{H}_6\text{N}$	Fisher and Mallinckrodt
Hydroxyl Hydrochloride	$\text{NH}_2\text{OH}\cdot\text{HCl}$	Fisher
Inositol		DIFCO
Iron metal	Fe	Fisher
Iron (III) Hydroxide	$\gamma\text{-FeOOH}$	Johnson Matthey
Iron (II) oxide	FeO	Johnson Matthey
Iron (III) Oxide	$\gamma\text{-Fe}_2\text{O}_3$	Johnson Matthey
Iron (III) Oxide	Fe_2O_3	Johnson Matthey
Iron Ref. Solution	1000 ppm Fe	Fisher
Lactic Acid	$\text{CH}_3\text{CH}(\text{OH})\text{COOH}$	Fisher
Lanthanum Chloride	$\text{LaCl}_3\cdot 7\text{H}_2\text{O}$	Fisher
Lead (II) Nitrate	$\text{Pb}(\text{NO}_3)_2$	Fisher
Lead Ref. Solution	1000 ppm Pb	Fisher
Lithium meta-Borate	LiBO_2	J.T. Baker and SPEX
Lithium Chloride	LiCl	Fisher
Magnesium Chloride Hexahydrate (crystal)	$\text{MgCl}_2\cdot 6\text{H}_2\text{O}$	Fisher and Mallinckrodt
Magnesium Sulfate	MgSO_4	Fisher
Manganese Ref. Solution	1000 ppm Mn	Fisher
Manganese (IV) dioxide	MnO_2	Fisher
Marine Broth 2216		DIFCO
Mercuric Chloride (powder)	HgCl_2	Fisher
Mercury	Triple Distilled	Baxter and Mallinckrodt
Methanol	CH_3OH	Baxter and Fisher

NAME	FORMULA	COMPANY
Methylene Blue		LabChem
Methylene Chloride (Optima)	CH_2Cl_2	Fisher
Methylene Iodide	CH_2I_2	Fisher
Methyl Orange	4-NaOSO ₂ C ₆ H ₄ N:NC ₆ H ₄ 4-N(CH ₃) ₂	Fisher
Methyl Orange Soln, 0.1%	Vol. Indicator	Fisher
Mixed Multi-Element Plasma Standard	1000 Ca, 400 K, 200 Al & Na, 20 Cr & Ni (ppm)	SPEX
Mordant Blue 9	Dye	Aldrich
Nickel (II) Ammonium Sulfate	$\text{Ni}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$	Fisher
Nickel (II) Hydroxide	$\text{Ni}(\text{OH})_2$	Johnson Matthey
Nickel (II) Oxide	NiO	Johnson Matthey
Nickel (II) Chloride	$\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$	Fisher
Nitric Acid (conc)	HNO_3 (~15.8N)	Fisher
Nitric Acid (Dilut-It)	HNO_3	J.T. Baker
Nitric Acid, 65%	HNO_3	Fisher
Nitric Acid (Optima) 69-71%	HNO_3	Fisher
Nutrient Broth		DIFCO
Oxalic Acid	$(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$	Fisher
Perchloric Acid, 70%	(HClO_4) w/w	Fisher
Petrolatum	Petroleum Jelly	Fisher
pH Buffer Solutions	1.00 thru 10.00	Fisher
pH Electrode Storage Soln	Potassium Hydrogen, Phthalate, Potassium Chloride, H ₂ O	Fisher
Phenolphthalein Alcoholic	0.5% in iso-propanol	Fisher
Phosphate buffered saline 10 mM	-	Sigma

NAME	FORMULA	COMPANY
o-Phosphoric Acid, 85%	H_3PO_4	Fisher
1,4-Piperazinediehtane sulfonic Acid (PIPES)	$C_8H_{18}N_2O_6S_2$	Kodak
Platinum	Spray Paint	Triclad
Potassium Bicarbonate	$KHCO_3$	Fisher
Potassium Biphthalate		see Potassium Hydrogen Phthalate
Potassium Bromate	$KBrO_3$	Fisher
Potassium Bromide	KBr	J. T. Baker
Potassium Chloride	KCl	Fisher and Mallinckrodt
Potassium Chromate	K_2CrO_4	Fisher
Potassium Dihydrate Phosphate	KH_2PO_4	NBS Standard
Potassium Ferricyanide	$K_3Fe(CN)_6$	Fisher
Potassium Ferrocyanide	$K_4Fe(CN)_6 \cdot 3H_2O$	Fisher
Potassium Fluoride	KF	Mallinckrodt
Potassium Hydrogen Phthalate	$HOCOC_6H_4COOK$	Fisher and NBS
Potassium Iodide	KI	Fisher
Potassium Ionic Strength Adjustor	5M NaCl	Orion
Potassium Nitrate (crystal)	KNO_3	Mallinckrodt
Potassium Permanganate (crystal)	$KMnO_4$	Fisher
Potassium Phosphate Monobasic	KH_2PO_4	Fisher
Potassium Ref. Soln.	1000 ppm K^+	Fisher and Orion
Potassium Thiocyanate	$KSCN$	Fisher
Potassium Tetroxalate	--	NBS Standard

NAME	FORMULA	COMPANY
Pyruvic Acid (sodium salt)	$\text{CH}_3\text{COCOONa}$	Fisher
iso-Propyl Ether	$[(\text{CH}_3)_2\text{CH}]_2\text{O}$	Fisher
2-propanol	$(\text{CH}_3)_2\text{CHOH}$	Fisher
4-(2-Pyridylazo)-Resorcinol	$\text{C}_{11}\text{H}_9\text{N}_3\text{O}_2$	Kodak
Quality Control Samples (minerals) Quinhydrone		SPEX
Rhodamine indicator		LabChem
L-serine	$\text{C}_3\text{H}_7\text{NO}_3$	DIFCO
Silicic Acid	$\text{SiO}_2 \cdot x\text{H}_2\text{O}$	Mallinckrodt
Silica Standard	1000 ppm SiO_2	Ricca
Silicon Standard	1000 ppm Si (in NaOH)	Ricca and Mallinckrodt
Silver Nitrate Soln, N/10	AgNO_3	Fisher
Sodium Acetate (crystal)	$\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$	Fisher
Sodium Bicarbonate	NaHCO_3	Fisher and NBS
Sodium Bisulfite	$\text{NaHSO}_3/\text{Na}_2\text{S}_2\text{O}_5$	Fisher
Sodium tetra-Borate Decahydrate (Borax)	$\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$	Fisher and Johnson Matthey
Sodium Carbonate	Na_2CO_3	Fisher and NBS
Sodium Chloride	NaCl	Fisher
Sodium Citrate	$\text{Na}_3\text{C}_6\text{H}_5\text{O}_7 \cdot 2\text{H}_2\text{O}$	Fisher and J.T. Baker
Sodium Dichromate	$\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$	Fisher
Sodium Fluoride	HF	Fisher
Sodium Hydrosulfite	$\text{Na}_2\text{S}_2\text{O}_4$	Fisher
Sodium Hydrosulfate	Na_2SO_3	Fisher
Sodium Hydroxide (Dilut-It)	NaOH	J.T. Baker

NAME	FORMULA	COMPANY
Sodium Hydroxide Soln N/20, N/2, N/10, N/100, 1N, 50% w/w	NaOH	Fisher
Sodium Ionic Strength Adjustor	4M NH ₄ Cl, 4M NH ₄ OH	Orion
Sodium Molybdate (VI) dihydrate	MoNa ₂ O ₄ ·2H ₂ O	Aldrich and Johnson Matthey
Sodium Nitrate	NaNO ₃	Fisher and Mallinckrodt
Sodium Nitrite	NaNO ₂	Fisher
Sodium Periodate	NaIO ₄	Aldrich
Sodium Pyrophosphate	Na ₄ P ₂ O ₇ ·10H ₂ O	
Sodium Phosphate	Na ₂ HPO ₄	Fisher
Sodium meta-Phosphate	(NaPO ₃) _x ·Na ₂ O, x_13	Fisher
Sodium Phosphate Monobasic	Na ₂ H ₂ PO ₄ ·H ₂ O	Fisher
Sodium Phosphate Tripoly	Na ₅ P ₃ O ₁₈	Fisher
Sodium Ref. Soln.	1000 ppm Na ⁺	Fisher
Sodium meta-Silicate	Na ₂ SiO ₃ ·9H ₂ O	Fisher and J.T. Baker
Sodium Standard	100 & 1000 ppm Na ⁺	Orion
Sodium Sulfate	Na ₂ SO ₄	Fisher and J.T. Baker
Sodium Sulfide	Na ₂ S·9H ₂ O	Fisher
Sodium Sulfite	Na ₂ SO ₃	Fisher
Sodium Thiosulfate	Na ₂ S ₂ O ₃	Fisher
Solvent Absorbant	Spill-X-C, Trademark	Wormald U.S. Inc.
Stannous Chloride	SnCl ₂	Fisher
Stannic Chloride	SnCl ₃	Fisher

NAME	FORMULA	COMPANY
Starch	$C_6H_{10}O_5$	Fisher
Strontium Chloride	$SrCl_2 \cdot 6H_2O$	Fisher
Strontium Chloride (anhydrous)	$SrCl_2$	Alfa Products
Strontium Standard	1000 ppm Sr	Ricca
Sulfur	S	Alfa
Sulfuric Acid (conc)	H_2SO_4 (~36N)	Fisher
Sulfuric Acid, 0.2N Volumetric Soln	H_2SO_4	J.T. Baker
Sulfuric Acid (Dilut-It)	H_2SO_4	J.T. Baker
Tartaric Acid	$HOOC(CHOH)_2COOH$	Fisher
Thenoyl-trifluoroacetone	$C_8H_5F_3O_2S$	Fisher
Titanium III Chloride	$TiCl_3$	Aldrich
Toluene	$C_6H_5CH_3$	Mallinckrodt
Toluene (radioactive)	3H -Toluene/ ^{14}C -Toluene	Packard
Tri-n-Butyl Phosphate	$(C_4H_9)_3PO_4$	Fisher
Tri-Butyl Phosphate	$C_{12}H_{27}O_4P$	Mallinckrodt
Triethanolamine	$C_6H_{15}NO_3$	Fisher
Tryptone		DIFCO
Tryptic Soy Broth		DIFCO
Ultima Gold		Packard
Uranium Ref. Standard	$UO_2(NO_3)_2$ (1000 ppm U)	Banco
Uranyl Acetate Dihydrate	$C_4H_6O_6U \cdot 2H_2O$	Fluka
Uranyl Nitrate (crystal)	$UO_2(NO_3)_2 \cdot 6H_2O$	Mallinckrodt
Urea	$(NH_2)_2CO$	Mallinckrodt
Welch Premium Vacuum Pump Oil	High Purity Paraffinic Mineral Oil	Welch

NAME	FORMULA	COMPANY
Xylenes	$C_6H_4(CH_3)_2$	Fisher
Zinc (metal)	Zn	Fisher
Zinc Acetate Dihydrate	$Zn(C_2H_3O_2)_2 \cdot 2H_2O$	Fisher
Zinc Ref Solution	1000 ppm Zn	Fisher
Zinc Sulfate	$ZnSO_4 \cdot 7H_2O$	Fisher

APPENDIX B

Sigma Chemical Co.	Aldrich Chemical Co., Inc.	Fluka Chemical Corp.
P.O. Box 14508	1001 West St. Paul	1001 West St. Paul
St. Louis, MO 63178	Milwaukee, WI 53233	Milwaukee, WI 53233
Phone: 314-771-5765	Phone: 414-273-3850	Phone: 414-273-3850

SECTION 1. - - - - - CHEMICAL IDENTIFICATION- - - - -

CATALOG #: A4206
NAME: ACETONE ACS REAGENT

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - -

CAS #: 67-64-1
MF: C3H6O
EC NO: 200-662-2

SYNONYMS

ACETON (GERMAN, DUTCH, POLISH) * ACETONE (ACGIH:DOT:OSHA) * CHEVRON
ACETONE * DIMETHYLFORMALDEHYDE * DIMETHYLKETAL * DIMETHYL KETONE *
KETONE, DIMETHYL * KETONE PROPANE * BETA-KETOPROPANE * METHYL KETONE *
PROPANONE * 2-PROPANONE * PYROACETIC ACID * PYROACETIC ETHER * RCRA
WASTE NUMBER U002 * UN1090 (DOT) *

SECTION 3. - - - - - HAZARDS IDENTIFICATION - - - - -

LABEL PRECAUTIONARY STATEMENTS

FLAMMABLE (USA)
HIGHLY FLAMMABLE (EU)
IRRITANT
IRRITATING TO RESPIRATORY SYSTEM AND SKIN.
RISK OF SERIOUS DAMAGE TO EYES.
TARGET ORGAN(S):
LIVER
KIDNEYS
KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING.
KEEP CONTAINER TIGHTLY CLOSED IN A COOL WELL-VENTILATED PLACE.
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF
WATER AND SEEK MEDICAL ADVICE.
WEAR SUITABLE PROTECTIVE CLOTHING.

SECTION 4. - - - - - FIRST-AID MEASURES- - - - -

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF
WATER FOR AT LEAST 15 MINUTES.
ASSURE ADEQUATE FLUSHING OF THE EYES BY SEPARATING THE EYELIDS
WITH FINGERS.
FLUSH SKIN WITH WATER.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
REMOVE AND WASH CONTAMINATED CLOTHING PROMPTLY.

SECTION 5. - - - - - FIRE FIGHTING MEASURES - - - - -

EXTINGUISHING MEDIA

CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

WATER MAY BE EFFECTIVE FOR COOLING, BUT MAY NOT EFFECT EXTINGUISHMENT.

SPECIAL FIREFIGHTING PROCEDURES

WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS

EXTREMELY FLAMMABLE.

VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK.

SECTION 6. - - - - - ACCIDENTAL RELEASE MEASURES- - - - -

EVACUATE AREA.

SHUT OFF ALL SOURCES OF IGNITION.

WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.

COVER WITH AN ACTIVATED CARBON ADSORBENT, TAKE UP AND PLACE IN CLOSED CONTAINERS. TRANSPORT OUTDOORS.

VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. - - - - - HANDLING AND STORAGE- - - - -

REFER TO SECTION 8.

SECTION 8. - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - -

CHEMICAL SAFETY GOGGLES.

MECHANICAL EXHAUST REQUIRED.

SAFETY SHOWER AND EYE BATH.

COMPATIBLE CHEMICAL-RESISTANT GLOVES.

NIOSH/MSHA-APPROVED RESPIRATOR.

FACESHIELD (8-INCH MINIMUM).

DO NOT BREATHE VAPOR.

DO NOT GET IN EYES, ON SKIN, ON CLOTHING.

AVOID PROLONGED OR REPEATED EXPOSURE.

WASH THOROUGHLY AFTER HANDLING.

SEVERE EYE IRRITANT.

KEEP TIGHTLY CLOSED.

KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.

STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - -

APPEARANCE AND ODOR

COLORLESS LIQUID

PHYSICAL PROPERTIES

BOILING POINT: 56 C

MELTING POINT: -94 C

FLASHPOINT 1 F
- 17C

EXPLOSION LIMITS IN AIR:

UPPER 13%

LOWER 2%

AUTOIGNITION TEMPERATURE: 869 F 464C

VAPOR PRESSURE: 184MM 20 C 400MM 39.5 C

SPECIFIC GRAVITY: 0.791

VAPOR DENSITY: 2

SECTION 10. - - - - -STABILITY AND REACTIVITY - - - - -

INCOMPATIBILITIES
BASES
OXIDIZING AGENTS
REDUCING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE

SECTION 11. - - - - - TOXICOLOGICAL INFORMATION - - - - -

ACUTE EFFECTS
MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION.
CAUSES SEVERE EYE IRRITATION.
CAUSES SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT.
CAUSES DERMATITIS.
TARGET ORGAN(S):
LIVER, KIDNEYS
RTECS #: AL3150000

ACETONE

IRRITATION DATA

EYE-HMN 500 PPM	JIHTAB 25,282,43
SKN-RBT 395 MG OPEN MLD	UCDS** 5/7/70
SKN-RBT 500 MG/24H MLD	85JCAE -,280,86
EYE-RBT 20 MG SEV	AJOPAA 29,1363,46
EYE-RBT 20 MG/24H MOD	85JCAE -,280,86

TOXICITY DATA

UNR-MAN LDLO:1159 MG/KG	85DCAI 2,73,70
ORL-RAT LD50:5800 MG/KG	JTEHD6 15,609,85
IHL-RAT LC50:50100 MG/M3/8H	AIHAAP 20,364,59
IVN-RAT LD50:5500 MG/KG	NPRI* 1,1,74
ORL-MUS LD50:3 GM/KG	PCJOAU 14,162,80
IHL-MUS LC50:44 GM/M3/4H	CUTOEX 1,47,93
IPR-MUS LD50:1297 MG/KG	SCCUR* -,1,61
ORL-RBT LD50:5340 MG/KG	FAONAU 48A,86,70
SKN-GPG LD50:>9400 MG/KG	TXAPA9 7,559,65

TARGET ORGAN DATA
BRAIN AND COVERINGS (RECORDINGS FROM SPECIFIC AREAS OF CNS)
SENSE ORGANS AND SPECIAL SENSES (OTHER OLFACTION EFFECTS)
SENSE ORGANS AND SPECIAL SENSES (CONJUNCTIVA IRRITATION)
BEHAVIORAL (GENERAL ANESTHETIC)
BEHAVIORAL (MUSCLE WEAKNESS)
BEHAVIORAL (MUSCLE CONTRACTION OR SPASTICITY)
LUNGS, THORAX OR RESPIRATION (RESPIRATORY DEPRESSION)
LUNGS, THORAX OR RESPIRATION (OTHER CHANGES)
KIDNEY, URETER, BLADDER (RENAL FUNCTION TESTS DEPRESSED)
EFFECTS ON FERTILITY (POST-IMPLANTATION MORTALITY)
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES
(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR

COMPLETE INFORMATION.

SECTION 12. - - - - - ECOLOGICAL INFORMATION - - - - -
DATA NOT YET AVAILABLE.

SECTION 13. - - - - - DISPOSAL CONSIDERATIONS - - - - -
BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND
SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS HIGHLY
FLAMMABLE.

OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - TRANSPORT INFORMATION - - - - -
CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. - - - - - REGULATORY INFORMATION - - - - -

EUROPEAN INFORMATION

EC INDEX NO: 606-001-00-8

HIGHLY FLAMMABLE

IRRITANT

R 11

HIGHLY FLAMMABLE.

S 9

KEEP CONTAINER IN A WELL-VENTILATED PLACE.

S 16

KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING.

S 23

DO NOT BREATHE VAPOR.

S 33

TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK

ACGIH TLV-TWA 750 PPM; STEL 1000 PPM 85INA8 6,10,91

EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION

FEREAC 54,7740,89

MSHA STANDARD-AIR:TWA 1000 PPM (2400 MG/M3)

DTLVS* 3,3,71

OSHA PEL (GEN INDU):8H TWA 1000 PPM (2400 MG/M3)

CFRGBR 29,1910.1000,94

OSHA PEL (CONSTRUC):8H TWA 1000 PPM (2400 MG/M3)

CFRGBR 29,1926.55,94

OSHA PEL (SHIPYARD):8H TWA 1000 PPM (2400 MG/M3)

CFRGBR 29,1915.1000,93

OSHA PEL (FED CONT):8H TWA 1000 PPM (2400 MG/M3)

CFRGBR 41,50-204.50,94

OEL-AUSTRALIA:TWA 500 PPM (1185 MG/M3);STEL 1000 PPM JAN93

OEL-AUSTRIA:TWA 750 PPM (1780 MG/M3) JAN93

OEL-BELGIUM:TWA 750 PPM (1780 MG/M3);STEL 1000 PPM JAN93

OEL-DENMARK:TWA 250 PPM (600 MG/M3) JAN93

OEL-FINLAND:TWA 500 PPM (1200 MG/M3);STEL 625 PPM (1500 MG/M3) JAN93

OEL-FRANCE:TWA 750 PPM (1800 MG/M3) JAN93

OEL-GERMANY:TWA 1000 PPM (2400 MG/M3) JAN93

OEL-HUNGARY:TWA 600 MG/M3;STEL 1200 MG/M3 JAN93

OEL-INDIA:TWA 750 PPM (1780 MG/M3);STEL 1000 PPM (2375 MG/M3) JAN93

OEL-JAPAN:TWA 200 PPM (470 MG/M3) JAN93
OEL-THE NETHERLANDS:TWA 750 PPM (1780 MG/M3) JAN93
OEL-THE PHILIPPINES:TWA 1000 PPM (2400 MG/M3) JAN93
OEL-POLAND:TWA 200 MG/M3 JAN93
OEL-RUSSIA:TWA 200 PPM;STEL 200 MG/M3 JAN93
OEL-SWEDEN:TWA 250 PPM (600 MG/M3);STEL 500 PPM (1200 MG/M3) JAN93
OEL-SWITZERLAND:TWA 750 PPM (1780 MG/M3) JAN93
OEL-TURKEY:TWA 1000 PPM (2400 MG/M3) JAN93
OEL-UNITED KINGDOM:TWA 1000 PPM (2400 MG/M3);STEL 1250 PPM JAN93
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NIOSH REL TO ACETONE-AIR:10H TWA 250 PPM
NIOSH* DHHS #92-100,92
NOHS 1974: HZD 02820; NIS 350; TNF 99713; NOS 188; TNE 1287794
NOES 1983: HZD 02820; NIS 358; TNF 97342; NOS 215; TNE 1740164; TFE
540313
EPA GENETOX PROGRAM 1988, NEGATIVE: SHE-CLONAL ASSAY; CELL
TRANSFORM.-MOUSE EMBRYO
EPA GENETOX PROGRAM 1988, NEGATIVE: CELL TRANSFORM.-RLV F344 RAT EMBRYO
EPA GENETOX PROGRAM 1988, NEGATIVE: IN VITRO CYTOGENETICS-NONHUMAN
EPA GENETOX PROGRAM 1988, NEGATIVE: HISTIDINE REVERSION-AMES TEST; IN
VITRO SCE-NONHUMAN
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES
ON EPA IRIS DATABASE
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, OCTOBER 1996
NIOSH ANALYTICAL METHOD, 1994: KETONES I, 1300
NTP TOXICITY STUDIES, RPT# TOX-03, MAY 1996
OSHA ANALYTICAL METHOD #ID-69

SECTION 16. - - - - - OTHER INFORMATION- - - - -
THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO
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**CENTER FOR NUCLEAR WASTE
REGULATORY ANALYSES**

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ADMINISTRATIVE PROCEDURE

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Title: Hazard Communication Program

EFFECTIVITY AND APPROVAL

Revision 1 of this procedure became effective on 05/13/2002. This procedure consists of the pages and changes listed below.

<u>Page No.</u>	<u>Change</u>	<u>Date Effective</u>
All	0	05/13/2002

SUPERSEDED

Supersedes Procedure No. AP-016, Revision 0 Change 0 dated 02/10/98.

Approvals

Written By  Bruce Mabrito	Date 5/9/2002	Concurrence Review  Bradley Werling	Date 5/9/2002
Quality Assurance  Mark Ekstrom	Date 5/13/02	Cognizant Director  Henry Garcia	Date 5/13/02

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AP-016 HAZARD COMMUNICATION PROGRAM

Hazard communication provides information to employees regarding hazardous chemicals in the work area. OSHA standards (29 CFR 1910.1200) require that information concerning chemical hazards in the workplace be transmitted to employees.

1. RESPONSIBILITIES

- a. Management of the hazard communication program for this cost center: Bradley Werling, Building 57, 522-6565.
- b. Maintenance of the chemical inventory and Material Safety Data Sheets (MSDS) for each laboratory in Building 51 and Building 57 is assigned to the following Division 20 staff:

Yi-Ming Pan—Building 57 laboratories: L101, L104, L105, L111, and L113.

Bradley Werling—Building 57 laboratories: L102 and L106.

Jim Prikryl—Building 51 laboratories.

2. METHODS OF INFORMATION

- a. Employees will be informed of chemical hazards during non-routine tasks by the following method(s): supervisors' verbal or written instructions, and reviewing MSDS.
- b. Employees will be informed of the hazards of chemicals in unlabeled pipes by the following method(s): supervisors verbal or written warning, warning signs, and reviewing MSDS.
- c. Contractors will be informed of the hazards of chemicals by the following method(s): Center for Nuclear Waste Regulatory Analyses (CNWRA) supervisors verbal or written instructions, warning signs, and reviewing MSDS.
- d. Contractors will be informed of measures to protect their employees by the following method(s): CNWRA supervisors verbal or written instructions, warning signs, and reviewing MSDS.

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3. LABELING AND OTHER FORMS OF WARNING

- a. All hazardous chemical containers will be labeled, tagged, or marked with required information listed in 3b.
- b. Labels, tags, and markings will include the identity of the hazardous chemical, appropriate hazard warnings, and the name and address of the chemical manufacturer, importer, or other responsible party.
- c. Containers without appropriate forms of warning will be properly labeled. The receiving cost center or user will take action to return the material, obtain a label from the manufacturer, or purchase a label.
- d. Portable containers such as those used to transfer or measure chemicals do not have to be labeled if intended for brief, temporary use (on that shift). Unlabeled containers will not be left unattended under any circumstances.

4. MATERIAL SAFETY DATA SHEETS

- a. MSDS will be available to employees before or upon the arrival of hazardous chemicals at the workplace.
- b. MSDS—each laboratory or group of laboratories will maintain a hard copy MSDS for each chemical on the chemical inventory.

5. EMPLOYEE TRAINING AND INFORMATION

- a. Employees who work with or around hazardous chemicals will be properly trained. Training will be conducted at the time of an employee initial assignment and whenever a new chemical is introduced into the work area which poses a significantly greater hazard or a different type of hazard.
- b. Employees will receive training in the following:
 1. Methods to detect hazardous chemicals
 2. Physical and health hazards of chemicals (reference MSDS)
 3. Employee's protection measures
 4. Details of the hazard communication program

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- c. Employees will be provided the following information:
 - 1. Operations where hazardous chemicals are present
 - 2. Location and availability of the written hazard communication program
 - 3. Location and availability of the chemical inventory list
 - 4. Location and availability of MSDS

6. RECORD KEEPING

- a. Hazard communication programs will be updated annually or as new hazards enter the workplace.
- b. Employee training and information sheets will be forwarded to the Division 20 hazard communication representatives.
- c. A record of individual employee training will be maintained with the hazard communication program in Division 20.
- d. A copy of all hazard communication programs (as updated) will be forwarded to the Southwest Research Institute Safety Department.

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Revision 2 Change 0

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Title : Hazard Communication Written Program

EFFECTIVITY

Revision 2 of this procedure became effective on August 2003. This procedure consists of the pages and changes listed below.

<u>Page No.</u>	<u>Change No.</u>	<u>Date Effective</u>
All	0	8/20/2003

Supersedes Procedure No. AP-016, Revision 1, Change 0 dated 05/13/2002

Approvals			
Written by Bradley Werling	Date 8-19-03	Concurrence Review Darrell Dunn	Date 8-19-03
Quality Assurance Robert Brient	Date 8/20/03	Recognized Director Buddy Sagar	Date 8/20/03

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AP-016 HAZARD COMMUNICATION PROGRAM

1. PURPOSE

The purpose for the hazard communication program is to provide employees the necessary health and safety information regarding hazardous chemicals in the work place. Occupational Safety and Health Administration standards (29 CFR 1910.1200) require that information concerning chemical hazards in the workplace be transmitted to employees.

2. RESPONSIBILITIES

2.1 Managing of the hazard communication program for this cost center

- Bradley Werling—Building 57, 522-6565.

2.2 Providing training and information

- Supervisors
- Division Chemical Hygiene Officer
- Division Safety Representative
- Southwest Research Institute® (SwRI) Department of Safety and Industrial Hygiene

2.3 Maintaining of the chemical inventory and Material Safety Data Sheets (MSDS) for each laboratory in Building 51 and Building 57:

- Yi-Ming Pan—Building 57 laboratories: L101, L105, L111, and L113.
- Bradley Werling—Building 57 laboratories: L102, L104, and L106.
- Jim Prikryl—Building 51 laboratories.

2.4 Ensuring proper labeling on containers

- Division Chemical Hygiene Officer

3. METHODS OF PROVIDING INFORMATION

Information about chemical hazards from routine tasks, nonroutine tasks, and unlabeled pipes will be provided by the following methods

- Training from Center for Nuclear Waste Regulatory Analyses (CNWRA) supervisors, the CNWRA Chemical Hygiene Officer, the CNWRA Safety Representative, and the SwRI Safety Department

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- Administrative procedures such as the Laboratory Chemical Hygiene Plan (AP-010) and the Hazardous Communication Program (AP-016).
- MSDS(s)
- Warning signs

4. LABELING AND OTHER FORMS OF WARNING

A hazardous chemical poses a physical or health hazard. Examples of physical hazards include fire, explosion, and corrosion. Examples of health hazards include carcinogens, toxic agents, irritants, and reproductive toxins. Health hazards can be acute and/or chronic.

4.1 All hazardous chemical containers will be labeled, tagged, or marked with the following required information:

- Identity of the hazardous chemical(s)
- Hazard warnings
- Name of the manufacturer, importer, or other responsible party (optional on staff-labeled chemical containers).

4.2 Manufacturer's labels will be left intact and legible.

4.3 Containers received without appropriate forms of warning will be properly labeled. The receiving cost center or user will take action to either label the material, obtain a label from the manufacturer, or return the material.

4.4 The Hazardous Materials Identification Guide (HMIG) system will be used for hazardous chemicals that require labeling by the staff. The HMIG system was developed by Lab Safety Supply Inc. See Appendix A for an explanation of the HMIG labeling system.

4.5 Portable containers, such as those used to transfer or measure chemicals, do not require labels if intended for immediate use. Unlabeled containers will not be left unattended under any circumstances.

5. MATERIAL SAFETY DATA SHEETS

5.1 MSDS will be available to employees before or upon the arrival of hazardous chemicals at the workplace.

5.2 MSDSs will be readily accessible to employees. Each group of laboratories will maintain a hard copy MSDS for each chemical on its chemical inventory. The CNWRA laboratories are divided into three groups.

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- Building 57 laboratories L101, L105, L111, and L113.
MSDSs located in L111
- Building 57 laboratories L102, L104, and L106
MSDSs located in L106
- Building 51 laboratories (all)
MSDSs located in front area

6. CHEMICAL INVENTORY

Each group of laboratories will maintain a current chemical inventory. The chemical inventories will be in the following locations.

- Building 57 laboratories L101, L105, L111, and L113
Chemical inventory located in L111
- Building 57 laboratories L102, L104, and L106
Chemical inventory located in L106
- Building 51 laboratories
Chemical inventory located in front area

7. WRITTEN HAZARDOUS COMMUNICATIONS PROGRAM

7.1 The SwRI written hazardous communications program is located in Section 2.4 of the Safety Policies and Procedures Manual (SPPM). The SPPM is available on the SwRI intranet (<http://i2net/>) in the Documents section.

7.2 The CNWRA written hazardous communications program (AP-016) is available on the division's QA website (<http://tuti/qa/>) in the Administrative Procedure section.

7.3 Each group of laboratories will maintain a hard copy of the CNWRA written hazardous communications program. The hard copies will be located in the following areas.

- Building 57 laboratories L101, L105, L111, and L113.
Written hazardous communications program located in L111
- Building 57 laboratories L102, L104, and L106
Written hazardous communications program located in L106
- Building 51 laboratories (all)
Written hazardous communications program located in front area

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8. EMPLOYEE TRAINING AND INFORMATION

8.1 Training will be conducted at the time of an employee's initial assignment and annually thereafter. Initial training will be conducted in two parts. The first part will be conducted via the computer based course Right-to-Know - Course Number 6700050. The second part will consist of a training session conducted by the Chemical Hygiene Officer or designee.

8.2 Additional training will be provided by the immediate supervisor, the principle investigator, the Chemical Hygiene Officer or the safety representative whenever a new chemical which poses a significantly greater hazard or a different type of hazard is introduced into the work area.

8.3 Employees will receive training in the following:

- Methods that may be used to detect the presence or release of hazardous chemicals
- Physical and health hazards of chemicals
- Employee protection measures
- Details of the hazard communication program

8.4 Employees will be provided the following information:

- Operations where hazardous chemicals are present
- Location and availability of the written hazard communications program
- Location and availability of chemical inventory lists
- Location and availability of MSDSs

9. RECORD KEEPING

9.1 Hazard communication programs will be updated annually or as new hazards enter the workplace.

9.2 A copy of the CNWRA hazard communications program (as updated) will be forwarded to the SwRI Safety Department.

9.3 Hazard communication training records will be maintained by the CNWRA Director of Quality Assurance.

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APPENDIX A: EXPLANATION OF THE HMIG LABELING SYSTEM

The HMIG label consists of four color-coded categories. The blue color represents the health hazard of the material. The red color represents the flammability of the material. The yellow color represents the reactivity of the material. The white color represents the protective equipment to be used when handling the material.

Figure 1 contains an example of a blank HMIG label. The first three categories use a numbering system to rank the hazard level of the material. The numbers range from zero to four and represent minimal, slight, moderate, serious, and extreme levels, respectively. Table 1 contains a detailed definition of each hazard level for each of the three categories. The fourth category uses a letter to indicate the protective equipment required for handling the material. Table 2 identifies the protective equipment associated with each letter. The information required for a HMIG label can be found in the MSDS. In some cases, the MSDS will explicitly give the HMIG ranking information. However, in other cases, the HMIG ranking information is not explicitly given and must be derived from information within the MSDS.



Figure 1. Blank HMIG Label From Lab Safety Supply Inc.

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Table 1. HMIG Hazard Levels for the Health, Flammability, and Reactivity Categories.

Hazard Level	Health	Flammability	Reactivity
Extreme-4	Highly toxic—May be fatal on short term exposure. Special protective equipment required.	Extremely flammable gas or liquid. Flash point below 73 °F.	Explosive at room temperature.
Serious-3	Toxic—Avoid inhalation or skin contact.	Flammable—Flash point 73 °F to 100 °F.	May explode if shocked, heated under confinement, or mixed with water.
Moderate-2	Moderately toxic—May be harmful if inhaled or absorbed.	Combustible—Requires moderate heating to ignite. Flash point 100 °F to 200 °F.	Unstable, may react with water.
Slight-1	Slightly toxic—May cause slight irritation.	Slightly combustible—Requires strong heating to ignite.	May react if heated or mixed with water.
Minimal-0	All chemicals have some degree of toxicity.	Will not burn under normal conditions.	Normally stable, does not react with water.

Source: Lab Safety Supply Inc.

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Table 2. HMIG Protective Equipment Guide.

	A	B	C	D	E	F	G	H	I	J	K	X*
Safety Eyewear	✓	✓	✓		✓	✓	✓	✓	✓	✓		
Gloves		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Apron			✓	✓		✓		✓		✓		
Face Shield				✓								
Dust/Mist Respirator					✓	✓						
Vapor Respirator							✓	✓				
Boots											✓	
Dust & Vapor Respirator									✓	✓		
Full Suit											✓	
Supplied-Air Respirator											✓	

*Ask your supervisor for special handling instructions
Source: Lab Safety Supply Inc.