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MSDS: Material Safety Data Sheet

Chemistry LabPaqs

This list includes all the chemicals used in the chemistry LabPaqs:
CK-1, CK-1A, CK-101, CK-2, and CK-S produced by HOL.
Only some of these chemicals are in each LabPaq.

Effective Date 04-01-07

SAFETY – This Material Safety Data Sheet (MSDS) is designed to provide chemical, physical, health, and safety information on reagents and supplies used by HOL. While all experiments in HOL LabPaqs are micro-scale or small-scale, which reduces most potential risks, unforeseen risks may still exist. The need to prevent injuries and accidents cannot be over-emphasized! No chemicals should be mixed or used other than as directed in the Lab Manual which accompanies the LabPaq. Make sure to store the LabPaq out of the reach of children and pets. Thoroughly read and review the Basic Safety information in your Lab Manual, the MSDS information, and sign the Safety Contract. Make sure to wear the proper protective equipment and clothing.

HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazard: Corrosive, Acids & Bases

COMPOSITION	CAS NUMBER	PEL/TLV	% by Volume	HAZARD
Ammonium hydroxide, 6M	1336-21-6	N/A	40	Corrosive/Burns
Hydrochloric acid, 1M, 6M	7647-01-0	N/A	8, 50	Corrosive/Burns
Iron (III) chloride, 2M	10025-77-1	N/A	54	Corrosive/Burns
Nitric acid, 2M, 6M	7697-37-2	N/A	12, 40	Corrosive/Burns/Oxidizer
pH 10 buffer solution	N/A	N/A	N/A	Corrosive/Burns
Ammonium hydroxide	7631-90-5	N/A	20, 30	Corrosive/Burns
Ammonium chloride	12125-02-9	N/A	10	Irritant
Sodium bisulfate crystals	7631-90-5	N/A	100	Corrosive/Burns
Sodium hydroxide, 0.5M, 1M, 2M, 6M	1310-73-2	N/A	2, 4, 8, 24	Corrosive/Burns
Tin (II) chloride, 1M	10025-69-1	N/A	23	Corrosive/Burns

Hazard: Toxic/Oxidizer, Nitrates & Poisons

COMPOSITION	CAS NUMBER	PEL/TLV	% by Volume	HAZARD
Acetamide crystal	60-35-5		100	Toxic
Aluminum nitrate, 0.1M	7784-27-2	N/A	4	Harmful/Oxidizer
Ammonium nitrate, 0.1M	6484-52-2	N/A	<1	Harmful/Oxidizer
Ammonium oxalate, 0.3M	6009-70-7	N/A	5	Toxic
Barium chloride, 0.3M	10326-27-9	N/A	7.5	Toxic
Barium nitrate, 0.1M, 0.3M	10022-32-8	N/A	2.6, 8	Toxic/Oxidizer
Calcium nitrate, 0.1M, 0.5M	13477-34-4	N/A	2.5, 12	Harmful/Oxidizer
Cobalt (II) nitrate, 0.1M	10026-22-9	N/A	3	Harmful/Oxidizer
Copper (Cu) metal pieces	7440-50-8	N/A	100	Toxic
Copper (II) carbonate powder	12069-69-1	N/A	100	Toxic
Copper (II) nitrate, 0.1M	3251-23-8	N/A	2.5	Toxic/Oxidizer
Copper (II) nitrate crystal	3251-23-8	N/A	100	Toxic/Oxidizer
Copper (II) sulfate, 0.2M, 1M, 2M	7758-99-8	N/A	5, 25, 50	Toxic
Cupric (II) nitrate, 0.1M, 0.5M	3251-23-8	N/A	2.5, 12	Toxic/Oxidizer
Iron (III) nitrate, 0.1M	7782-61-8	N/A	4	Harmful/Oxidizer
Lead (Pb) metal pieces	7439-92-1	N/A	100	Toxic
Lead (II) nitrate, 0.1M, 0.2M, /1M	10099-74-8	N/A	3.5, 7, 33	Toxic/Oxidizer
Lithium nitrate, 0.5M	7790-69-4	N/A	3.5	Oxidizer
Mixture of Solids	N/A	N/A	N/A	Harmful
Benzoic acid	65-85-0	N/A	N/A	Harmful
Iron filings	7439-89-6	N/A	N/A	Irritant
Sand	N/A	N/A	N/A	Irritant
Sodium chloride	7647-14-5	N/A	N/A	Irritant
Nickel (II) nitrate, 0.1M	13478-00-7	N/A	3	Harmful/Oxidizer
Potassium chromate, 1M	7789-00-6	N/A	19.5	Toxic/Corrosive/Oxidizer
Potassium nitrate, 0.5M, 1M	7757-79-1	N/A	5, 10	Harmful/Oxidizer
Silver nitrate, 0.1M	7761-88-8	N/A	1.7	Harmful/Oxidizer
Sodium hypochlorite, 1%	7681-52-9	N/A	1.0	Harmful
Sodium nitrate, 0.5M	7631-99-4	N/A	4.2	Harmful/Oxidizer
Sodium sulfide, 0.1M, 0.2M	1313-84-4	N/A	2, 5	Toxic
Strontium nitrate, 0.5M	10042-76-9	N/A	10.6	Toxic/Oxidizer
Unknown, CK-2 X 11, CK-S X20	N/A	N/A	4	Harmful/Oxidizer
Zinc nitrate, 0.1M, 2M	10196-18-6	N/A	3, 60	Toxic/Oxidizer
Zinc sulfate, 1M	7446-20-0	N/A	29	Toxic

Chemistry LabPaqs

Effective Date: 04/01/2007
Product Codes: CK-1, CK-1A, CK-101, CK-2, CK-S

Hazard: Flammable

<u>COMPOSITION</u>	<u>CAS NUMBER</u>	<u>PEL/TLV</u>	<u>% by Volume</u>	<u>HAZARD</u>
Phenolphthalein, 1% in Reagent Alcohol	77-09-8	N/A	1.0	Flammable/Toxic
Ethyl alcohol	64-17-5	1000 ppm	90.5	Flammable
Methyl alcohol	67-56-1	200 ppm	4.53	Flammable/Toxic
Isopropyl alcohol	67-63-0	400 ppm	4.97	Flammable
Phenolphthalein	77-09-8	N/A	1	Irritant
Organic reagent	68476-34-6	N/A	100	Flammable

Hazard: Slight or Minimal, Miscellaneous

<u>COMPOSITION</u>	<u>CAS NUMBER</u>	<u>PEL/TLV</u>	<u>% by Volume</u>	<u>HAZARD</u>
Alka Seltzer®	N/A	N/A	N/A	Irritant
Aluminon Reagent	569-58-4	N/A	<1	Irritant
Aluminum (Al) metal pieces	7429-90-5	N/A	100	Harmful
Aluminum chloride, 1M	7784-13-6	N/A	24	Harmful
Ammonium molybdate, 0.2M	12027-67-7	N/A	25	Harmful
Blue dye #-1	3844-45-9	N/A	<1	Irritant
Blue dye #-2	860-22-0	N/A	<1	Irritant
Blue litmus paper	N/A	N/A	N/A	Harmful
Bromthymol blue, 0.04%	34722-90-2	N/A	<1	Irritant
Calcium chloride, dihydrate	10035-04-8	N/A	100	Irritant
Calmagite Indicator, 0.1%	3147-14-6	N/A	<1	Irritant
Dialysis tubing	N/A	N/A	N/A	Harmful
Glycerin	56-81-5	NA	N/A	Harmful
Sulfur	7704-34-9	N/A	N/A	Harmful
EDTA, 0.01M, 0.15M	6381-92-6	N/A	<1, 6	Irritant
Iron (Fe) metal pieces	7439-89-6	N/A	100	Harmful
Lead acetate paper	N/A	N/A	N/A	Harmful
Limewater, calcium hydroxide	1305-62-0	N/A	<1	Irritant
Magnesium (Mg) metal pieces	7439-95-4	N/A	100	Harmful
Magnesium chloride, 2M	7791-18-6	N/A	41	Irritant
Magnesium oxide powder	1309-48-4	N/A	100	Irritant
Magnesium sulfate, 1M, 2M	10034-99-8	N/A	25, 50	Irritant
Manganese (Mn) metal pieces	7439-96-5	N/A	100	Harmful
Mossy (Zn), zinc pieces	7440-66-6	N/A	100	Harmful
pH test paper, low range	N/A	N/A	N/A	Harmful
pH test paper, high range	N/A	N/A	N/A	Harmful
Potassium ferrocyanide, 0.2M	14459-95-1	N/A	8.5	Harmful
Potassium iodide, 0.1M	7681-11-0	N/A	2	Irritant
Red dye #-3	16423-68-0	N/A	<1	Irritant
Red dye #40	25956-17-6	N/A	<1	Irritant
Red litmus paper	N/A	N/A	N/A	Harmful
Sodium bicarbonate, 0.1M, 1M	144-55-8	N/A	<1, 9	Irritant
Sodium bisulfate, 0.1M	7631-90-5	N/A	1.0	Irritant
Sodium bromide, 0.1M	7647-15-6	N/A	1.0	Irritant
Sodium carbonate, 0.1M	497-19-8	N/A	1.0	Irritant
Sodium carbonate, powder	497-19-8	N/A	100	Irritant
Sodium chloride, 0.1M	7647-14-5	N/A	<1	Irritant
Sodium chloride crystal	7647-14-5	N/A	100	Irritant
Sodium iodide, 0.1M	7681-82-5	N/A	1.5	Irritant
Sodium phosphate, tribasic, 0.1M	10101-89-0	N/A	4	Irritant
Sodium sulfate, 0.1M, 1M	7757-83-7	N/A	1, 14	Irritant
Sodium thiosulfate, 0.3M	10102-17-7	N/A	7.5	Irritant
Starch, 1% with	9005-84-9	N/A	N/A	Irritant
0.02% Thimerosal	54-64-8	N/A	<1	Toxic
Thymol blue, 0.04%	81012-93-3	N/A	<1	Irritant
Tin (Sn) metal pieces	7440-31-5	N/A	100	Harmful
Water of known hardness	N/A	N/A	N/A	Irritant
Yellow dye #-5	1934-21-0	N/A	<1	Irritant
Yellow dye #-6,	2783-94-0	N/A	<1	Irritant
Unknown dye	N/A	N/A	N/A	Irritant
Unknown, CK-2 X10, CK-101 X14	N/A	N/A	1	Irritant
Unknown weak acid solution	N/A	N/A	NA	irritant
Zinc (Zn) metal pieces	7440-66-6	N/A	100	Harmful

EMERGENCY OVERVIEW

Hazard: Corrosive, Acids & Bases

DANGER! POISON! CORROSIVE LIQUID AND VAPOR! CAN CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

Nitric acid: Strong oxidizer! Can react violently and/or cause fire when contact is made with other materials.

SAFETY RATINGS: Health: 3, Severe (Poison) Reactivity: 3, Severe (Oxidizer)
Flammability: 0, None Contact: 4, Extreme (Corrosive)

Protective Equipment: Goggles, Lab Coat or Apron, Gloves, Local or General Exhaust Ventilation.

Hazard: Toxic/Oxidizer, Nitrates & Poisons

WARNING! VERY HAZARDOUS IF SWALLOWED. MAY CAUSE MODERATE TO SEVERE IRRITATION TO EYES AND/OR BURNS RESULTING IN CORNEAL INJURY. HARMFUL IF INHALED. CAN CAUSE IRRITATION AND OR BURNS TO SKIN, EYES AND RESPIRATORY TRACT.

OXIDIZERS: CONTACT WITH OTHER MATERIAL MAY CAUSE A FIRE.
POISONS: VERY HAZARDOUS IF SWALLOWED.

Potassium chromate and Acetamide: CANCER HAZARD. CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure. Known to be a human carcinogen.

SAFETY RATINGS: Health: 3, Severe (Poison) Reactivity: 3, Severe (Oxidizer)
Flammability: 0, None Contact: 3, Severe (Corrosive)

Protective Equipment: Goggles, Lab Coat or Apron and Gloves.

Hazard: Flammables

Health Hazards/Precautionary Measures:

POISON! VAPOR HARMFUL! MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CANNOT BE MADE NONPOISONOUS, AFFECTS CENTRAL NERVOUS SYSTEM AND LIVER. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

Physical Hazards/Precautionary Measures:

DANGER! FLAMMABLE LIQUID AND VAPOR! KEEP AWAY FROM HEAT, SPARKS, FLAMES, STATIC ELECTRICITY OR OTHER SOURCES OF IGNITION. DO NOT SMOKE IN LABORATORY AREA!

SAFETY RATINGS: Health: 3, Severe (Poison) Reactivity: 1, Slight
Flammability: 3, Severe (Flammable) Contact: 1, Slight

Protective Equipment: Safety Glasses, Lab Coat or Apron, Gloves, Local or General Exhaust Ventilation.

Hazard: Slight or Minimal, Miscellaneous

WARNING! MAY CAUSE IRRITATION TO EYES, SKIN AND RESPIRATORY TRACT. MAY BE HARMFUL IF SWALLOWED OR INHALED.

SAFETY RATINGS: Health: 1, Slight Reactivity: 1, None
Flammability: 0, None Contact: 1, Slight

Protective Equipment: Safety Glasses, Lab Coat or Apron, Gloves.

POTENTIAL HEALTH EFFECTS

Hazard: Corrosive, Acids & Bases

INHALATION:

Effects from inhalation of vapor vary from mild irritation to serious damage of the upper respiratory tract, depending on severity and length of exposure. Symptoms may include coughing, sneezing, choking, sore throat and irritation to the nasal or respiratory tract.

INGESTION:

Corrosive! Ingestion may result in death. Swallowing may cause severe burns of mouth, throat, and stomach. Symptoms may include bleeding, nausea, vomiting, and diarrhea. Asphyxia from throat swelling and perforations of the esophagus and/or stomach can occur.

SKIN CONTACT:

Corrosive! Causes severe irritation, redness, pain and burns. Concentrated solutions can cause deep ulcer and discolor skin.

EYE CONTACT:

Corrosive! Causes severe redness, pain, blurred vision, eye burns with possibility of permanent eye damage.

CHRONIC EXPOSURE:

May cause dermatitis and conjunctivitis. Dental erosion, tooth discoloration, nasal ulceration, laryngitis, bronchitis, pneumonia and gastrointestinal disturbances can occur. Long term exposures seldom occur due to the corrosive properties of the acid.

Chemistry LabPaqs

Effective Date: 04/01/2007
Product Codes: CK-1, CK-1A, CK-101, CK-2, CK-S

AGGRAVATION of PRE-EXISTING CONDITIONS:

Persons with pre-existing skin disorders, eye problems or impaired respiratory function may be more susceptible to the effects of the substances.

<u>NTP CARCINOGEN</u>		<u>IARC CATAGORY</u>	<u>OSHA REGULATED</u>
<u>KNOWN</u>	<u>ANTICIPATED</u>		
N/A	N/A	N/A	YES

Hazard: Toxic/Oxidizer, Nitrates & Poisons

INHALATION:

Effects are expected to be less severe than for exposure to higher concentrations where symptoms include severe irritation to the respiratory tract with coughing, wheezing, shortness of breath, nausea and vomiting. May be absorbed into the body following inhalation, with symptoms paralleling those of ingestion exposure.

INGESTION:

Effects are expected to be less severe than for exposure to higher concentrations where symptoms include pain and burning in the mouth, blackening of the skin and mucous membranes, throat, abdomen, diarrhea and shock. Poison in higher concentrations.

SKIN CONTACT:

Effects are expected to be less severe than for exposure to higher concentrations where symptoms include redness, pain, irritation and burns.

EYE CONTACT:

Effects are expected to be less severe than for exposure to higher concentrations where symptoms include redness, pain, irritation, blurred vision and eye burns with possibility of permanent eye damage.

CHRONIC EXPOSURE:

Prolonged or repeated exposure may cause symptoms that parallel those described above for inhalation, ingestion, skin contact and eye contact.

AGGRAVATION of PRE-EXISTING CONDITIONS:

Persons with pre-existing skin disorders, eye problems, allergies or known sensitization may be more susceptible to the effects of the substances

<u>INGREDIENT</u>	<u>NTPP CARCINOGEN</u>		<u>IARC CATAGORY</u>	<u>OSHA REGULATED</u>
	<u>KNOWN</u>	<u>ANTICIPATED</u>		
Potassium Chromate	YES	N/A	1	YES
Acetamide	N/A	YES	N/A	YES

Hazard: Flammables:

INHALATION:

Exposure may cause irritation to the mucous membranes of the upper respiratory tract. Prolonged exposures to high concentrations may cause drowsiness, loss of appetite and inability to concentrate.

INGESTION:

Cause headaches, gastritis, intoxication, blindness and, in acute cases, death.

SKIN CONTACT:

Causes skin irritation, cracking or flaking due to dehydration and defatting action.

EYE CONTACT:

Can cause eye irritation. Splashes may cause temporary pain and blurred vision.

CHRONIC EXPOSURE:

Prolonged skin contact causes drying and cracking of skin. May affect the nervous system. May affect liver, blood, reproductive system. Continued ingestion of small amounts could result in blindness.

AGGRAVATION of PRE-EXISTING CONDITIONS:

Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance.

<u>NTP CARCINOGEN</u>		<u>IARC CATAGORY</u>	<u>OSHA REGULATED</u>
<u>KNOWN</u>	<u>ANTICIPATED</u>		
N/A	N/A	N/A	YES

Hazard: Slight or Minimal, Miscellaneous

INHALATION:

May be harmful. May cause irritation to nasal membranes and respiratory tract.

INGESTION:

May be harmful. May cause nausea, vomiting, headache and diarrhea.

SKIN CONTACT:

May cause irritation.

EYE CONTACT:

May cause irritation.

POTENTIAL CHRONIC HEALTH EFFECTS:

Prolonged or repeated exposure may cause symptoms that parallel those described above for inhalation, ingestion, skin contact and eye contact.

MEDICAL CONDITIONS GENERALLY AGGRAVATED by EXPOSURE:

Persons with pre-existing skin disorders, eye problems, allergies or known sensitization may be more susceptible to the effects of the substances

<u>NTP CARCINOGEN</u>	<u>ANTICIPATED</u>	<u>IARC CATAGORY</u>	<u>OSHA REGULATED</u>
KNOWN N/A	N/A	N/A	YES

FIRST AID MEASURES

Hazard: Corrosive, Acids & Bases

INHALATION:

Remove to fresh air. If not breathing, give artificial respiration. Call a physician immediately.

INGESTION:

DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call a physician immediately.

SKIN CONTACT:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician for medical advice.

EYE CONTACT:

Check for and remove contact lens. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

Hazard: Toxic/Oxidizer, Nitrates & Poisons

INHALATION:

Remove to fresh air. If not breathing, give artificial respiration. Call a physician immediately.

INGESTION:

DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call a physician immediately.

SKIN CONTACT:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician for medical advice.

EYE CONTACT:

Check for and remove contact lens. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

Hazard: Flammables:

INHALATION:

Remove to fresh air. If not breathing, give artificial respiration. Call a physician immediately.

INGESTION:

DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call a physician immediately.

SKIN CONTACT:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician for medical advice.

EYE CONTACT:

Check for and remove contact lens. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

Hazard: Slight or Minimal, Miscellaneous

INHALATION:

Remove to fresh air if effects occur.

INGESTION:

DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call a physician for medical advice.

SKIN CONTACT:

Wash with mild soap and water. Get medical advice if irritation develops.

EYE CONTACT:

Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical advice if irritation develops.

FIRE FIGHTING MEASURES

FIRE:

Flash Point: N/A Flammable Limits: N/A LEL: N/A UEL: N/A

EXPLOSION:

N/A - Use any means suitable for extinguishing surrounding fire.

SPECIAL INFORMATION:

N/A

NFPA RATINGS: Health: 3 Flammability: 3 Reactivity: 3

NOTE: The contents of this LabPaq should not be a factor in a fire due to the extremely small quantities.

HANDLING AND STORAGE

Store in a cool, dry, ventilated area away from flame, sources of ignition and heat. Keep containers tightly closed and upright. Protect from physical damage. Keep out of direct sunlight and separate from incompatible materials. Storage and use areas should be non-smoking. Dispose of waste materials or spills as directed in the Lab Manual.

PERSONAL PROTECTION

VENTILATION SYSTEM:

A system of local and/or general exhaust is recommended to keep exposures below the Airborne Exposure Limits.

PERSONAL RESPIRATORS (NIOSH) APPROVED:

N/A

SKIN PROTECTION:

Wear protective clothing, gloves, lab coat or apron, as appropriate, to prevent skin contact.

EYE PROTECTION:

Use chemical safety glasses or goggles.

PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	N/A
ODOR:	N/A
SOLUBILITY:	N/A
SPECIFIC GRAVITY:	N/A
pH:	N/A
% VOLATILES by VOLUME:	N/A
BOILING POINT:	N/A
MELTING POINT:	N/A
VAPOR DENSITY (Air =1):	N/A
VAPOR PRESSURE (mm Hg):	N/A
EVAPORATION RATE (BuAc=1):	N/A

STABILITY AND REACTIVITY

STABILITY:

Stable under ordinary conditions of use and storage

HAZARDOUS DECOMPOSITION PRODUCTS:

N/A

HAZARDOUS POLYMERIZATION:

N/A

INCOMPATIBILITIES:

No chemicals should be mixed or used other than as directed in the Lab Manual which accompanies the LabPag.

CONDITIONS to AVOID:

Heat, flames, ignition sources and incompatibles

OTHER INFORMATION

TRANSPORT (Land, DOT):

Small Quantity Exception. Complies with 49 CFR 173.4 and IATA 2.7

PRODUCT USE:

Laboratory Reagent

Hands-On Labs, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. HANDS-ON LABS, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS, ACCORDINGLY, HANDS-ON LABS, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.