

## **Kit #22 Osmosis and Diffusion**



## 1. IDENTIFICATION

### 1.1 Product Identifiers

Product Name: Lugol's Solution  
Alternative names: Lugol's Solution 1.9%.  
Product Number: 180-4EA, 22-3EA, A22-3, C22-3, 22-LSPKG, 23-4EA, 23-LSPKG, 65-1EA, 66-2EA, CASE-B019, SGI-P008, SS-1B22E.

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: For laboratory and educational use only.

### 1.3 Details of the supplier of the safety data sheet

Company: LAB-AIDS®, Inc, 17 Colt Ct., Ronkonkoma, NY 11779, USA.  
Telephone: +1 800 381 8003.  
Fax: +1 631 820 8268.

**1.4 Emergency telephone number:** Emergency number: CHEMTREC 1 800 424-9300.

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### GHS classification

Specific target organ toxicity, oral (Category 1), Thyroid, H372  
Eye Irrit. (Category 2A), H319; Skin Irrit. (Category 2), H315  
Aquatic Acute (Category 2), H401  
Specific Target Organ Toxicity, Respiratory (Category 3), H335

### 2.2 Label elements, including precautionary statements:

Signal word: Danger  
Hazards statements: H 401— Toxic to aquatic life. H372— Causes damage to organs (Thyroid) through prolonged or repeated exposure if swallowed, H335— May cause respiratory irritation. H319—Causes serious eye irritation, H315—Causes skin irritation.  
Precautionary statements: P273—Avoid release to the environment; P280 - Wear protective gloves, eye protection



Pictogram:

### 2.3 Hazards not otherwise classified: None

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**3.1 Substance:** Not applicable

### 3.2 Mixture

Chemical Name	Product identifier	%	GHS-US classification
Water	CAS# 7732-18-5	92.4%	Not classified
Potassium iodide	CAS# 7681-11-0	5.7%	Acute Tox. 4 (Oral), H302; Skin Irrit. 2, H315, Eye Irrit. 2A H319
Iodine	CAS# 7553-56-2	1.9%	Acute Tox. 4, H332; Acute Tox. 4, H312; Skin Corr. 1, H314; Eye Dam 1 H318; STOT RE 1, H372; STOT SE 3, H335; Aquatic Acute 1, H400.

**3.3 Chemicals where a trade secret is claimed:** None

## 4. FIRST AID MEASURE

### 4.1 Description of the first aid measure:

**INGESTION:** Never give anything by mouth to unconscious person. Rinse mouth and get conscious person drink a glass of milk or water. Do NOT induce vomiting unless directed to do so by medical personnel. Get immediate medical attention.

**INHALATION:** Remove to fresh air. Get medical attention if necessary.

**EYE CONTACT:** Wash immediately with plenty of water, and continue washing for at least 15min., occasionally lifting upper and lower eyelids. Seek medical attention if necessary.

**SKIN CONTACT:** Flush thoroughly with mild soap and water. Remove contaminated clothing. Get medical attention if irritation develop.

**4.2 Most important symptoms and effects, both acute and delayed:** Refer to section 11.

**4.3 Indication of any immediate medical attention and special treatment needed:** No additional information available.

## 5. FIREFIGHTING MEASURES

### 5.1 Extinguishing media: Nonflammable liquid

Suitable extinguishing media: Use TriClass, dry chemical extinguisher for surrounding fires.

**5.2 Special hazard arising from the substance or mixture:** Excessive heat releases vapors of hydrogen iodide.

**5.3 Advice for firefighters:** Use self-contained breathing apparatus and protective clothing.

## 6. ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions:** Wear laboratory grade gloves, eye protection and a lab coat.

**6.2 Emergency procedures:** Restrict unprotected personnel from the area.

**6.3 Methods and material used for containment and cleanup procedure:** Contain the spill with an inert absorbent material and deposit in a sealed bag or container. For small spill use paper towel. Place the wet medium in trash. Ventilate and wash spill area with soap and water.

## 7. HANDLING AND STORAGE

**7.1 Precaution for safe handling:** Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Use only under adult supervision. Avoid breathing vapor. Use with adequate ventilation. Wash hands thoroughly after handling.

**7.2 Storage:** Keep container in cool, well-ventilated area. Keep away from heat.

**7.3 incompatibility:** Refer to section 10.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters:** ACGIH: TWA: 0.01mg/m<sup>3</sup>

**8.2 Exposure controls:** Avoid contact with eyes, skin, and clothing. Wear chemical splash goggles, chemical-resistant gloves, and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits.

**Respiratory protection:** None should be needed if normal laboratory handling at room temperature.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:** Liquid.

**Appearance:** Dark brown.

**Odor:** Not available

**pH:** Not available

**Vapor Pressure ( mm Hg):** Not available

**Vapor Density:** Not available

**Evaporation Rate:** Not available

**Viscosity:** N/A

**Flash point:** N/A

**Autoignition:** N/A

**Boiling point:** Not available

**Melting point:** Not available

**Freezing point:** Not available

**Decomposition temp:** Not available

**Solubility:** Not available

**Specific gravity (H<sub>2</sub>O = 1):** ≈1 at 20°C

**Percent volatile (%):** 100%

**Molecular formula:** Mixture

**Molecular weight:** Mixture

## 10. STABILITY AND REACTIVITY

**Chemical Stability:** Stable

**Conditions to Avoid:** High temperatures and incompatible materials.

**Incompatibilities:** Oxidizing agents, reducing agents, organic material, metals, acids, salts and alkaloids.

**Hazardous decomposition:** Excessive heat releases vapors of hydrogen iodide.

**Hazardous polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

**Acute effects:** Eyes: Cause serious eye irritation. Eye contact with excessive amount of iodine vapor may also cause blepharitis. Skin: It may cause skin irritation. It may cause temporary brown stains on skin. Inhalation: Excessive inhalation of iodine vapors may cause respiratory tract irritation, that includes nasal cavity and mucus membrane irritation. Ingestion: Ingestion of large doses may cause irritation to mouth with thirst, nausea, vomiting, abdominal pain, hypomotility and diarrhea. It may also affect cardiovascular system. Chronic exposure to elevated concentration of iodine may damage thyroid.

### Toxicological data

Acute toxicity ORAL LD<sub>50</sub>: 14,000mg/kg [Rat] (Iodine).

Acute toxicity DERMAL LD<sub>50</sub>: 1,425mg/kg [Rat] (Iodine).

Acute vapor toxicity IHL-LC<sub>50</sub>: 4,588mg/kg [Rat] (Iodine).

### Carcinogenicity:

California prop 65: Not classified

## 12. ECOLOGICAL INFORMATION

LC50 Oncorhynchus mykiss (rainbow trout) 96 hours: 1.7 mg/l. LC50 (iodine). EC50 Daphnia magna ( Water flea) 48 hours: 0.2 mg/l. (iodine)

EC50 Daphnia magna ( Water flea) 48 hours: 2.7 mg/l. (potassium iodide)

## 13. DISPOSAL CONSIDERATION

Disposal of in accordance with all local, state, and federal regulations, or contact with a licensed chemical disposal agency.

## 14. TRANSPORT INFORMATION

**UN number:** N/A

**Shipping name:** N/A

**Hazard Class:** N/A

**Packing group:** N/A

**Exceptions:** Ltd Qty. N/A

## 15. REGULATORY INFORMATION

TSCA-listed, DSCL (EEC) R36/38 Irritating to eyes and skin, WHMIS (Canada) not controlled.

## 16. OTHER INFORMATION

### Disclaimer:

The Safety Data Sheet (SDS) is for guidance and is based upon information and tests believed to be reliable. LAB-AIDS® makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation and verification. The data should not be confused with local, state, federal regulations, or insurance mandates, and CONSTITUTE NO WARRANTY. Any use of these data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond LAB-AIDS, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

## 1. IDENTIFICATION

### 1.1 Product Identifiers

Product Name: Glucose Solution  
Alternative names: Corn syrup water solution.  
Product Number: 22-1EA, A22-1, C22-1, SGI-B009, SS-1B20xx

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: For laboratory and educational use only

### 1.3 Details of the supplier of the safety data sheet

Company: LAB-AIDS®, Inc, 17 Colt Ct., Ronkonkoma, NY 11779, USA  
Telephone: +1 800 381 8003.  
Fax: +1 631 820 8268

### 1.4 Emergency telephone number

Emergency number: CHEMTREC 1 800 424-9300

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### GHS classification:

Carcinogenicity (Category 1A), H350  
Skin Sensitization (Category 1), H317



### 2.2 Label elements, including precautionary statements

Signal word: Danger  
Hazards statements: H350-May cause cancer, H317-May cause an allergic skin reaction.  
Precautionary statements: P264 - Wash exposed skin thoroughly after handling, P280 - Wear protective gloves, eye protection.

Pictogram:

### 2.3 Hazards not otherwise classified: None.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substance: Not applicable

### 3.2 Mixture:

Chemical Name	Product identifier	%	GHS-US classification
Water	CAS# 7732-18-5	52.2%	Not classified
Glucose	CAS# 50-99-7	47%	Not classified
Benzyl Benzoate	CAS# 120-51-4	0.3%	Acute Tox. 4, H302; Acute Aquatic 2, H401; Chronic Aquatic 2 H411
Formaldehyde	CAS# 50-00-0	0.5%	Flam. Liq. 4, H227; Acute Tox. 3, H301+H311+H331; Carc. 1A, H350; Skin Corr. 1B, H314, Eye Dam. 1, H318; Muta. 2, H341; Acute Aquatic 3, H402; STOT SE 1, 370, STOT RE 1, H372

### 3.3 Chemicals where a trade secret is claimed: None

## 4. FIRST AID MEASURE

### 4.1 Description of the first aid measure:

**INGESTION:** Never give anything by mouth to unconscious person. Rinse mouth and get conscious person drink a glass of milk or water. Do NOT induce vomiting unless directed to do so by medical personnel. Get immediate medical attention.

**INHALATION:** Remove to fresh air. Get medical attention if necessary.

**EYE CONTACT:** Wash immediately with plenty of water, and continue washing for at least 15min., occasionally lifting upper and lower eyelids. Seek medical attention if necessary.

**SKIN CONTACT:** Flush thoroughly with mild soap and water. Remove contaminated clothing. Get medical attention if irritation develops.

### 4.2 Most important symptoms and effects, both acute and delayed: Refer to section 11.

### 4.3 Indication of any immediate medical attention and special treatment needed: No additional information available.

## 5. FIREFIGHTING MEASURES

### 5.1 Extinguishing media:

Suitable extinguishing media: Use water spray, alcohol-resistant foam, or TriClass, dry chemical extinguisher.

### 5.2 Special hazard arising from the substance or mixture: Not available

### 5.3 Advice for firefighters: Use self-contained breathing apparatus and protective clothing.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions: Wear laboratory grade gloves, eye protection and a lab coat.

### 6.2 Emergency procedures: Restrict unprotected personnel from the area.

**6.3 Methods and material used for containment and cleanup procedure:** Contain the spill with an inert absorbent material and deposit in a sealed container. For small spill use paper towel. Dry material place in trash. Ventilate and wash spill area with soap and water.

## 7. HANDLING AND STORAGE

**7.1 Precaution for safe handling:** Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Use only under adult supervision. Avoid breathing vapor. Use hood or with adequate ventilation. Wash hands thoroughly after handling.

### 7.2 Storage: Keep container in cool, well-ventilated area.

### 7.3 incompatibility: Refer to section 10.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters:** ACGIH: TWA: 3ppm (formaldehyde); USA OSHA: TWA: 0.75ppm (formaldehyde); NIOSH: TWA: 0.016ppm (formaldehyde).  
**8.2 Exposure controls:** Avoid contact with eyes, skin, and clothing. Wear chemical splash goggles, chemical-resistant gloves, and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits.  
**Respiratory protection:** Non should be needed if normal laboratory handling at room temperature.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:** Liquid  
**Appearance:** White to yellow  
**Odor:** Not available  
**pH:** Not available  
**Vapor Pressure ( mm Hg):** 2.3kPa at 20 °C (water)  
**Vapor Density:** 0.63 (Air=1) (water)  
**Evaporation Rate:** not available  
**Viscosity:** not available  
**Flash point:** Not available  
**Autoignition:** Not available

**Boiling point:** Not available  
**Melting point:** Not available  
**Freezing point:** Not available  
**Decomposition temp:** Not available  
**Solubility:** Miscible.  
**Specific gravity (H<sub>2</sub>O = 1):** 1.20 at 20°C  
**Percent volatile (%):** Not available  
**Molecular formula:** Mixture  
**Molecular weight:** Mixture

## 10. STABILITY AND REACTIVITY

**Chemical Stability:** Stable  
**Conditions to Avoid:** Excessive temperatures, and incompatible materials.  
**Incompatibilities:** Not available  
**Hazardous decomposition:** Not available.  
**Hazardous polymerization:** Not available.

## 11. TOXICOLOGICAL INFORMATION

**Acute effects:** Eye: Not expected to cause eye irritation. Skin: Prolonged or repeated skin contact may cause dermatitis. Inhalation: Not expected to cause respiratory irritation. Ingestion: Prolonged and repeated ingestion may affect blood, brain, behavior, CNS.

### Toxicological data:

Formaldehyde  
ORAL LD<sub>50</sub>: 100mg/kg [Rat]. 42mg/kg [Mouse]. 260mg/kg [Guinea pig].  
SKIN LD<sub>50</sub>: 270mg/kg [Rabbit].

Benzyl Benzoate  
ORAL LD<sub>50</sub>: 1400mg/kg [Mouse].  
SKIN LD<sub>50</sub>: 4000mg/kg [Rabbit].

### Carcinogenicity:

California prop 65: Formaldehyde  
Formaldehyde is A2 Suspected Human Carcinogen

## 12. ECOLOGICAL INFORMATION

LC<sub>50</sub> 0.032-0.226ml/L, Oncorhynchus mykiss, 96h, (formaldehyde). 41mg/L Brachydanio rerio, 96h, (formaldehyde) 2mg/L, Daphnia magna 48h, (formaldehyde)

## 13. DISPOSAL CONSIDERATION

Disposal of in accordance with all local, state, and federal regulations, or contact with a licensed chemical disposal agency.

## 14. TRANSPORT INFORMATION

**UN number:** Not available  
**Shipping name:** Not controlled.  
**Hazard Class:** N/A  
**Packing group:** N/A  
**Exceptions:** N/A

## 15. REGULATORY INFORMATION

TSCA-listed.

## 16. OTHER INFORMATION

### Disclaimer:

The Safety Data Sheet (SDS) is for guidance and is based upon information and tests believed to be reliable. LAB-AIDS® makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration , investigation and verification. The data should not be confused with local, state, federal regulations, or insurance mandates, and CONSTITUTE NO WARRANTY. Any use of these data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling , storage, use and disposal of the product(s) described are beyond LAB-AIDS, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

## 1. IDENTIFICATION

### 1.1 Product Identifiers

Product Name: Liquid Starch  
 Alternative names: Starch water solution.  
 Product Number: 22-2EA, A22-2, C22-2, 23-3EA, CASE-B009xx, FS-2B04xx, SS-1B21xx, SGI-B010, TX-B016

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: For laboratory and educational use only

### 1.3 Details of the supplier of the safety data sheet

Company: LAB-AIDS®, Inc, 17 Colt Ct., Ronkonkoma, NY 11779, USA  
 Telephone: +1 800 381 8003.  
 Fax: +1 631 820 8268

**1.4 Emergency telephone number:** Emergency number: CHEMTREC 1 800 424-9300

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### GHS classification

Not hazardous substance or mixture

### 2.2 Label elements, including precautionary statements

Signal word: Not classified  
 Hazards statements: Not classified  
 Precautionary statements: Not classified

Pictogram: Not classified

**2.3 Hazards not otherwise classified:** none

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**3.1 Substance:** Not applicable

### 3.2 Mixture

Chemical Name	Product identifier	%	GHS-US classification
Water	CAS# 7732-18-5	N/A	Not classified
Starch solution	N/A	N/A	Not classified
Benzyl Benzoate	CAS# 120-51-4	<1%	Acute Tox. 4, H302; Acute Aquatic 2; Chronic Aquatic 2 H411

**3.3 Chemicals where a trade secret is claimed:** Concentration of the mixture

## 4. FIRST AID MEASURE

### 4.1 Description of the first aid measure:

**INGESTION:** Never give anything by mouth to unconscious person. Rinse mouth and get conscious person drink a glass of milk or water. Do NOT induce vomiting unless directed to do so by medical personnel. Get immediate medical attention.

**INHALATION:** Remove to fresh air. Get medical attention if necessary.

**EYE CONTACT:** Wash immediately with plenty of water, and continue washing for at least 15min., occasionally lifting upper and lower eyelids. Seek medical attention if necessary.

**SKIN CONTACT:** Flush thoroughly with mild soap and water. Remove contaminated clothing. Get medical attention if irritation develop.

**4.2 Most important symptoms and effects, both acute and delayed:** Refer to section 11.

**4.3 Indication of any immediate medical attention and special treatment needed:** No additional information available.

## 5. FIREFIGHTING MEASURES

**5.1 Extinguishing media:** Nonflammable liquid

Suitable extinguishing media: Use TriClass, dry chemical extinguisher for surrounding fires.

**5.2 Special hazard arising from the substance or mixture:** Not available.

**5.3 Advice for firefighters:** Use self-contained breathing apparatus and protective clothing.

## 6. ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions:** Wear laboratory grade gloves, eye protection and a lab coat.

**6.2 Emergency procedures:** Restrict unprotected personnel from the area.

**6.3 Methods and material used for containment and cleanup procedure:** Mop up the area.

## 7. HANDLING AND STORAGE

**7.1 Precaution for safe handling:** Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Use only under adult supervision. Avoid breathing vapor. Use with adequate ventilation. Wash hands thoroughly after handling.

**7.2 Storage:** Keep container in cool, well-ventilated area.

**7.3 incompatibility:** Refer to section 10.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters:** ACGIH: Not classified

**8.2 Exposure controls:** Avoid contact with eyes, skin, and clothing. Wear chemical splash goggles, chemical-resistant gloves, and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits.

**Respiratory protection:** None should be needed if normal laboratory handling at room temperature.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:** Liquid.

**Appearance:** Milky.

**Odor:** Not available

**pH:** Not available

**Vapor Pressure ( mm Hg):** Not available

**Vapor Density:** Not available

**Evaporation Rate:** Not available

**Viscosity:** N/A

**Flash point:** N/A

**Autoignition:** N/A

**Boiling point:** Not available

**Melting point:** Not available

**Freezing point:** Not available

**Decomposition temp:** Not available

**Solubility:** Not available

**Specific gravity (H<sub>2</sub>O = 1):** Not available

**Percent volatile (%):** 100%

**Molecular formula:** Mixture

**Molecular weight:** Mixture

## 10. STABILITY AND REACTIVITY

**Chemical Stability:** Stable

**Conditions to Avoid:** Not available.

**Incompatibilities:** Not available

**Hazardous decomposition:** Not available.

**Hazardous polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

**Acute effects:** Eyes: No data available. Skin: No data available. Inhalation: No data available. Ingestion: No data available.

### Toxicological data

Acute toxicity ORAL LD<sub>50</sub>: 1400mg/kg [Mouse] (Benzyl benzoate).

Acute toxicity DERMAL LD<sub>50</sub>: 4000mg/kg [Rat] (Benzyl benzoate).

Acute toxicity IHL-LC<sub>50</sub>: Not available

### Carcinogenicity:

California prop 65: Not classified

## 12. ECOLOGICAL INFORMATION

Not available.

## 13. DISPOSAL CONSIDERATION

Disposal of in accordance with all local, state, and federal regulations, or contact with a licensed chemical disposal agency.

## 14. TRANSPORT INFORMATION

**UN number:** N/A

**Shipping name:** N/A

**Hazard Class:** N/A

**Packing group:** N/A

**Exceptions:** Ltd Qty. N/A

## 15. REGULATORY INFORMATION

TSCA-listed.

## 16. OTHER INFORMATION

### Disclaimer:

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