Preparation of Lugol's Solution

(Modified from Standard Methods 10200B.2)

1. SCOPE AND APPLICATION

   1.1 This method details the preparation of Lugol's solution, which is used to preserve phytoplankton samples.

   1.2 This preservative is used for samples with LIMS test codes PKD-QN-C and DTY-QN-C.

2. SUMMARY OF METHOD

   2.1 Deionized (DI) water, acetic acid, potassium iodide, and iodine crystals are mixed in the defined proportions, labeled, and stored.

3. APPARATUS AND EQUIPMENT

   3.1 Mettler Toledo balance, MS403TS/00
   3.2 Weigh boat
   3.3 Spatula
   3.4 Magnetic stir plate
   3.5 Erlenmeyer flask, 500 mL
   3.6 Teflon stir bar
   3.7 Glass amber bottle, 500 mL

4. REAGENTS AND CHEMICALS: AMOUNTS SHOWN WILL MAKE 450 ML OF LUGOL'S SOLUTION.

   4.1 Potassium iodide (KI), 40 g
   4.2 Iodine crystals, 20 g
   4.3 Glacial acetic acid, 40 mL
   4.4 Deionized (DI) water, 400 mL

5. METHODS

   5.1 Work in a fume hood. In the 500 mL Erlenmeyer flask, add 40 mL of Glacial acetic acid to 400 mL of DI water.

   5.2 Place the 500 mL Erlenmeyer flask on a magnetic stir plate and put the stir bar inside of flask.

   5.3 Add 40 g of potassium iodide and 20 g of iodine crystals to the acid/water solution.

   5.4 Stir solution for 30 minutes. Check to make sure all the crystals have dissolved.

   Note: If needed, the solution can be stirred for up to an hour.

   5.5 Pour mixed solution into 500 mL glass amber bottle. Label container with "Lugol's Solution", the prep date, analyst initials, and a batch number as generated per step 5.6.

   5.6 Generate a batch number in the Standard Preparation Tracker module in LIMS. Record the batch number (by hand or print a sticker) on the container.

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5.6.1 To create a batch number: LIMS → Laboratory → Standard Preparation Tracker: Select Group = Bio-Taxonomy. Select Reagent = New or Duplicate. If using New, enter all the information required. If using Duplicate, select the Identity of the solution type you are duplicating. Review and complete the information required for accuracy. A serial number (batch number) will be generated. Record this number. From Tools, print a label (do not print from Reagent if prompted because the sticker will not include all the necessary information). Refer to the tables below for "Prepared Reagent" and "Purchased Reagent".

5.6.2 Group: BIO-TAXONOMY
Standard/Reagent Preparation Tracker: Prepared

Prepared Duplicate Reagent

Identity	LUGOL
Type	Working Reagent
Holding Time	365 Days from prepared date
Entered By	Analyst Name
Prepared	Enter date, Time and Analyst Name
Location	B227-A Cabinet
Storage Temperature	Room Temperature
Balance ID	BIO-MS403TS-069
SOP	AB-07
See Also	Leave Blank
Description	Lugol's Solution
Additional Information	Leave Blank
Solvent Used	Water
Components Table	Final Volume: 450, Units: mL Click Add: Choose Purchase Materials Select Potassium Iodide (KI). Volume added: 40, Units: g Click Add: Choose Purchase Materials Select Iodine. Volume added: 20, Units: g Click Add: Choose Purchase Materials Select Acetic Acid, GL. Volume added: 40, Units: mL

Note: Be sure to record the proper amounts of reagents to avoid confusion.

5.6.3 Store the container at room temperature under a fume hood in the lab.

5.6.4 Group: BIO-TAXONOMY
Standard/Reagent Preparation Tracker: Purchased

Purchased Duplicate Reagent/Material

Identity	Iodine
Description	Iodine flakes
Entered by	Analyst Name
Type	Granule
Received	Enter date received
Expires	None
Grade	ACS Grade

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Purity	≥99.8%
Has Certificate of Analysis	No
Manufacturer	Fisher Scientific
Lot #	Enter number on bottle
Storage Location	B205
Additional Information	Cabinet above settling counter
Storage Temperature	Room temperature
Container Size	100
Units	g
Components	Iodine 99.8%

6. QUALITY CONTROL AND DOCUMENTATION

6.1 LIMS Standard Preparation Tracker module

6.2 To correct raw data entries, place a single line through the incorrect entry, write the corrected entry near the error and initial and date the correction. If the correction requires an explanation, write a comment, and reference the error.

6.3 See the DEP Laboratory Quality Manual

7. SAFETY

7.1 Lab coat, latex or vinyl gloves, and eye protection are required when working with chemicals and unprocessed samples.

7.2 Avoid breathing fumes or exposing co-workers to them. Use proper safety equipment, a lab hood or chemical ventilation system, and keep face away from open containers. Work in a well-ventilated area.

7.3 Reagent bottles must be labeled with the name and concentration of the reagent.

7.4 Refer to the Material Safety Data Sheet (MSDS) for information about reagents and chemicals in this SOP.

7.5 Refer to the DEP Laboratory Health and Safety Plan.

7.6 Refer to the DEP Laboratory Quality Manual.

8. POLLUTION PREVENTION AND WASTE MANAGEMENT

8.1 Refer to the DEP Laboratory Health and Safety Plan.

9. REFERNECES

9.1 DEP Laboratory Quality Manual

9.2 DEP Laboratory Health and Safety Plan

9.3 *Standard Methods 10200: Plankton* (2017)

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Appendix of Changes

07/12/2010 Reformatted the layout following SOP LB-001.

06/27/2013 Revised step 5.6 to use Standard Preparation Tracker module in LIMS.

07/01/2015 Formatted for 508 compliance. Added References section.

08/01/2016 Removed reference to Lugol's logbook; using LIMS Prep Tracker to generate batch number.

07/05/2022 Updated links to Quality manual and Safety plan.

06/13/2023 Updated links to Quality manual and Safety plan.

04/08/2025 Added Standard/Reagent Preparation Tracker for "Prepared Reagent" and "Purchased Reagent".

05/20/2026 Updated weighing balance model used and link to the Quality Manual

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