

LAB-AIDS® #19 A QUALITATIVE INTRODUCTION TO WATER POLLUTION KIT
Student Worksheet and Guide

This kit provides the necessary materials and methods for detecting various common water pollutants.

1. Read the instructions carefully before starting any experiment. Measure the chemicals carefully.
2. It is essential that all materials used be clean in order to obtain accurate results.
3. Replace caps and covers of vials and bottles immediately after use to prevent contamination.
4. Where possible, water samples should be drawn closely as possible to the source of supply. Avoid turbulence or air bubbles when filling sample bottles. Fill at a 45° angle.
5. Carefully record procedures and observations for each sample tested.

I Ammonia nitrogen

Procedure:

1. Measure a 10 mL water sample into the calibrated tube.
2. Add 1 drop of Ammonia Test Sol. #1 to the water sample. Mix.
3. Add 8 drops of Ammonia Test Sol. #2 to the water sample. Mix.
4. If ammonia nitrogen is present in sample, a yellow color will develop. Allow 8-10 minutes for full color development. (Note: The sample can be poured into the large well of the Chemplate® to await the time.)

II pH

Procedure:

1. Place a small sample of the water to be tested (8-10 drops) in a cavity of the Chemplate®.
2. Add 1 drop of Universal pH Indicator and mix with the plastic spatula. Compare the color that immediately appears with the list below:

pH 1	cherry red	pH 6	yellow
pH 2	rose	pH 7	yellow-green
pH 3	red-orange	pH 8	green
pH 4	orange-red	pH 9	blue-green
pH 5	orange	pH 10	blue

III Chlorine

Procedure:

1. Fill a Chemplate® cavity approximately 2/3 full with the water to be tested.
2. Add 2 drops of Chlorine Test Solution and mix with the plastic spatula.
3. If chlorine is present, a yellow color will develop. Allow 5 minutes for full color development.

IV Chromium (Chromate)

Procedure:

1. Measure a 10 mL water sample in a calibrated tube.
2. Add 2 drops of Chromium Extracting Solution to the water sample. Place cap on calibrated tube and shake.
3. Add a level spatula of the Chromate Indicator Powder. Replace the cap and mix the sample until the powder is dissolved.
4. A reddish-purple color forms in the presence of chromate and the amount of color is directly proportional to the amount of chromium (chromate) present in the sample.

V Copper

Procedure:

1. Fill a Chemplate® cavity approximately 2/3 full with a sample of the water.
2. Add 1 drop of Copper Test Sol. #1. Mix and allow to stand for 1 minute.
3. Add 2-3 drops of Copper Test Sol. #2. Mix and allow to stand at least 2 minutes but not more than 10 minutes.
4. An orange colored solution indicates the presence of copper.

VI Cyanide

Procedure:

1. Measure a 10 mL water sample into the calibrated tube.
2. Add 2 drops of Cyanide Test Sol. #1 and mix.
3. Add 2 drops of Cyanide Test Sol. #2 and mix.
4. If cyanide is present, a pink color will develop which turns violet in a few minutes. Allow approximately 10 minutes for the color to develop.

VII Iron

Procedure:

1. Measure a 5 mL water sample in the calibrated tube.
2. Add 5 drops of Iron Test Sol. #1. **(This is 5% Sulfuric acid – be careful.)**
3. Add 1 level spatula of Iron Indicator Powder to the sample. Replace the cap and mix to dissolve.
4. If iron is present, a wine red color will develop. Allow 2 minutes for full color development.

VIII Nitrate nitrogen

Procedure:

1. Place approximately a 3 mL sample of water in the calibrated tube.
2. Add enough Nitrate Test Sol. #1 (2 mL) to bring the sample up to 5 mL. Mix vigorously.
3. With the plastic spatula, add 2 level measures of Nitrate Indicator Powder #2.
4. Replace the cover and shake vigorously until the powder is completely dissolved.
5. If nitrate nitrogen is present, a very light pink color will develop in trace amounts within 1-2 minutes. A reddish purple color will develop with high concentrations of nitrate nitrogen. Allow 5 minutes for full color development. (A white precipitate will settle in the bottom of the tube which is not relevant to the presence of nitrates.)

IX Phosphorous (phosphates)

Procedure:

1. Measure a 5 mL water sample in the graduated tube.
2. Add 15 drops of Phosphate Test Sol. #1 and mix. Allow to stand 3-5 minutes. A light yellow color may appear.
3. Add 2-3 drops of Phosphate Test Sol. #2. Replace the cover and mix.
4. If phosphate is present, a blue color will form immediately.

X Silica

Procedure:

1. Measure a 5 mL water sample in the calibrated tube.
2. Add 3 drops of Silica Test Sol. #1 and mix.
3. Add 6 drops of Silica Test Sol. #2 and mix.
4. Add 4 drops of Silica Test Sol. #3 and mix.
5. Add 1 drop of Silica Test Sol. #4 and mix.
6. If silica is present, a blue color will form immediately.

XI Sulfide

Procedure:

1. Measure a 5 mL water sample in the graduated tube.
2. Add 15 drops of Sulfide Test Sol. #1 and mix. (**Note: This solution has a high sulfuric acid content and care should be taken.**)
3. Add 3 drops of Sulfide Test Sol. #2. Mix and allow to stand for 1 minute.
4. Add 20 drops of Sulfide Test Sol. #3 and mix.
5. If sulfide is present, a blue color will appear.

WATER SAMPLE NAME	LOCATION	DATE
TESTS	COLOR OBSERVED	(+) or (-)
I Ammonia Nitrogen		
II pH		pH ____
III Chlorine		
IV Chromium		
V Copper		
VI Cyanide		
VII Iron		
VIII Nitrate Nitrogen		
IX Phosphorus		
X Silica		
XI Sulfide		
Conclusions and Summary:		