Water Purification Testing and Disinfectant Calculations

Experiment 21 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To explain water-treatment stages, use a teaching test kit and calculate an instructor-assigned dose.

Principle

Water treatment may require clarification, filtration and validated disinfection. The required disinfectant dose depends on demand, product strength, contact time and the specified measured residual.

Key Points

- Inspect source and treatment steps before considering dose.
- Use the kit instructions for pH, turbidity or residual-chlorine testing.
- Chlorine demand and desired residual are different quantities.
- Potassium permanganate is not a routine substitute for validated drinking-water chlorination.

Activity Procedure

1. Map treatment

Draw source protection, settling/filtration where required, disinfection and protected storage.

2. Test

Use instructor-prepared teaching water and the assigned kit; record units, time and colour comparison.

3. Calculate chlorine

Use supplied volume, target dose and available-chlorine fraction; independently check units.

4. Calculate the assigned permanganate exercise

Use only the instructor-given model concentration in a worksheet; no universal drinking-water dose is inferred.

5. Interpret

State why a calculated mass does not replace residual testing and the validated treatment process.

Record and Observations

Volume / supplied dose	_____
Available chlorine fraction	_____
Calculated product mass	_____
Measured residual / contact time	_____
Assigned model dilution	_____

Result

Complete the record using your activity, then state the findings, the action required and the reason for that action.

Precautions

- Use supplied calculations and teaching test material.
- Do not instruct households to use a classroom worksheet dose without validated local guidance.

Viva Questions and Answers

1. Why measure residual?

Demand may consume disinfectant, so the added amount does not reveal the remaining residual.

2. Why account for product strength?

Only the active fraction contributes to the calculated chlorine amount.

3. Can permanganate be substituted automatically?

No; treatment selection and targets need validated guidance.

Worked Calculation

Illustrative worksheet values only.

- Required active chlorine (g) = dose (mg/L) × water volume (L) / 1,000.
- For 10,000 L at a supplied 2 mg/L dose: 20 g active chlorine. At 30% available chlorine, product mass = 20 / 0.30 = 66.7 g.
- Separate permanganate dilution exercise: 0.1% w/v stock is 1 g/L. To make 100 mL of an instructor-specified 0.01% model solution, C1V1 = C2V2 gives 10 mL stock, made to 100 mL. This is a calculation exercise, not a drinking-water instruction.

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