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ORS Powder

Experiment 6 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To prepare the reduced-osmolarity oral rehydration salts powder and state the correct reconstitution volume.

Principle

ORS supplies glucose and electrolytes in proportions that support intestinal sodium-glucose absorption and replacement of fluid losses. It is a dry mixture that must be dissolved in the exact stated water volume. Changing the volume changes every component concentration.

Requirements

- Anhydrous glucose, sodium chloride, potassium chloride and trisodium citrate dihydrate.
- Balance, dry mortar, sieve if prescribed, mixing sheet and moisture-resistant packet.

Procedure

1. Check materials

Confirm the hydrate forms and grades. Use anhydrous glucose and trisodium citrate dihydrate for the quantities below; a different hydrate requires a different calculation.

2. Weigh separately

Accurately weigh all components for one complete packet. Keep utensils dry and avoid leaving materials exposed to humidity.

3. Mix uniformly

Break up permissible soft agglomerates and mix by geometric dilution. Add the smallest ingredient to a similar quantity of larger material, then progressively incorporate the remainder.

4. Pack

Transfer the entire mixed batch to one suitable moisture-resistant packet. Record net mass and confirm that powder has not been lost during transfer.

5. Label and evaluate

State that the whole packet is dissolved in 1 litre of safe drinking water. Inspect for uniform appearance and intact packaging. Do not divide a mixed packet by eye for smaller reconstitution volumes.

Observations and Record

Ingredient	Quantity for 1 litre	Purpose
Anhydrous glucose	13.5 g	Supports sodium-glucose absorption
Sodium chloride	2.6 g	Sodium and chloride
Potassium chloride	1.5 g	Potassium and chloride
Trisodium citrate dihydrate	2.9 g	Citrate and sodium

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Total powder mass = 13.5 + 2.6 + 1.5 + 2.9 = 20.5 g for 1 litre.
- Glucose = 13.5 ÷ 180.16 ≈ 0.0749 mol/L, or approximately 75 mmol/L.
- The reduced-osmolarity formulation has nominal osmolarity 245 mOsm/L. For calculation practice only, a 200 mL formula scales all ingredients by 0.2; never obtain it by casually dividing a mixed retail packet.

Result

The calculated packet mass is 20.5 g. Actual packed mass: ____ g. The packet label states the required reconstitution volume: ____ litre.

Precautions

- Never add extra sugar, salt or flavouring to the prescribed reconstitution.
- The powder must be protected from moisture; clumping can affect uniform handling.
- A packet intended for 1 litre must not be dissolved in a smaller amount. Follow the product instructions for storage of the reconstituted liquid.

Viva Questions and Answers

1. Why does the water volume matter?

It determines sodium, glucose and other concentrations in the final solution.

2. Can a glucose hydrate be weighed at the anhydrous amount?

No; molecular mass and water of crystallisation affect the required quantity.

3. Why use geometric dilution?

It helps distribute ingredients with unequal amounts more evenly.

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