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Effervescent Granules

Experiment 7 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To prepare free-flowing effervescent granules and relate moisture control to their stability.

Principle

An acid reacts with a carbonate or bicarbonate in water to release carbon dioxide. Citric acid, tartaric acid and sodium bicarbonate are commonly used in teaching formulations. Granulation improves handling, but moisture during manufacture or storage can start the reaction too early.

Requirements

- Prescribed acid-bicarbonate formula, with any assigned drug and vehicle.
- Balance, dry mortar, sieve, granulation tray, controlled drying equipment and moisture-resistant container.

Procedure

1. Check the formula

Identify the acid forms and bicarbonate quantity. Calculate the batch and verify that the selected method is suitable for any drug present.

2. Prepare powders

Reduce permitted lumps, sieve the dry materials separately and mix in the specified sequence. Avoid generating excessive dust.

3. Granulate

Use the prescribed fusion or solvent-assisted method. For a fusion method, controlled release of crystal water helps produce a coherent mass; do not overheat or allow vigorous premature reaction.

4. Size and dry

Pass the suitable damp mass through the assigned sieve. Dry under the prescribed conditions, cool in a dry environment and resieve if required.

5. Evaluate and pack

Record granule appearance, flow and behaviour when a measured teaching portion is added to water. Pack promptly in a tightly closed moisture-resistant container.

Observations and Record

Check	Record	Observation
Granulation / drying	Method, sieve and drying condition	_____
Appearance / yield	Granule size, final dry mass	_____
Effervescence test	Test portion and water volume	_____

Worked Example

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

- Reaction: $H^+ + HCO_3^- \rightarrow CO_2 + H_2O$. One mole of bicarbonate consumes one mole of acid equivalents.
- If a teaching formula assigns 1 part citric acid, 2 parts tartaric acid and 3.4 parts sodium bicarbonate, total parts = 6.4. For 32 g, the calculated masses are 5 g, 10 g and 17 g.
- That parts ratio is an illustrative scaling exercise, not a universal official formula. Hydrate form and acid equivalents must be considered.

Result

Record the observed outcome and calculated value, with units. State whether the stated laboratory specification was met; do not copy the worked example as your result.

Precautions

- Keep water and humid air away until the dissolution test.
- Do not use uncontrolled heat to force granulation.
- Record drying conditions and final mass; apparent good flow alone does not prove stability.

Viva Questions and Answers

1. What causes effervescence?

Carbon dioxide is released when acid and bicarbonate react in water.

2. Why package immediately after cooling?

The exposed granules can take up moisture and react prematurely.

3. Why use both citric and tartaric acids in some formulas?

They can improve granulation and handling compared with either acid alone, depending on the method.

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