

Lecture Summary: Effervescent Granules

1. Definition

Effervescent granules are solid dosage forms containing acidic and basic components that react in the presence of water to release carbon dioxide (CO₂). This effervescence produces a sparkling solution, improving taste and drug dissolution.

2. Composition

- 1 Active ingredient (API) – therapeutic agent.
- 2 Acid source – citric acid or tartaric acid.
- 3 Carbonate source – sodium bicarbonate, potassium bicarbonate, or sodium carbonate.
- 4 Other excipients – flavoring agents, sweeteners, colorants, and binders.

Example formula: Citric acid : Tartaric acid : Sodium bicarbonate = 1 : 2 : 3.4

3. Principle of Effervescence

When the granules dissolve in water, the acid and bicarbonate react to produce CO₂ gas, aiding taste masking and enhancing drug solubility and absorption.

4. Advantages

- 1 Rapid disintegration and dissolution.
- 2 Improved taste masking and patient compliance.
- 3 Enhanced absorption due to pre-dissolved form.
- 4 Useful for patients with swallowing difficulties.

5. Disadvantages

- 1 Highly sensitive to moisture.
- 2 Requires moisture-proof packaging.
- 3 Higher manufacturing cost compared to regular granules.

6. Method of Preparation

(a) Dry/Fusion Method: Mix ingredients, apply gentle heat (~100°C) to release binding moisture, granulate and dry.

(b) Wet Method: Use non-aqueous solvent (e.g., ethanol) to form a damp mass, granulate, dry, and sieve.

7. Packaging and Storage

Pack in moisture-proof containers (e.g., aluminum foil sachets or sealed tubes). Store in a dry place below 25°C.

8. Evaluation Tests

- 1 Flow properties (angle of repose, bulk density).
- 2 Effervescence time (CO₂ release rate).

- 3 Dissolution and content uniformity.
- 4 Moisture content and stability.

9. Examples of Effervescent Products

- 1 Effervescent Paracetamol (Panadol®).
- 2 Effervescent Vitamin C tablets.
- 3 Aspirin effervescent granules.
- 4 Effervescent oral rehydration salts (ORS).

10. Summary

Effervescent granules offer a patient-friendly, stable, and rapidly dissolving dosage form. Control of moisture and processing conditions is essential to maintain product quality and stability.