



CODEN [USA]: IAJPBB

ISSN : 2349-7750

INDO AMERICAN JOURNAL OF  
**PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<https://doi.org/10.5281/zenodo.17713643>Available online at: <http://www.iajps.com>

Review Article

**REVIEW OF EFFERVESCENT POWDER FOR GLOWING SKIN**Revati Rajesh Hiwarale<sup>1\*</sup>, Pratiksha Pandurang dake<sup>2</sup>, Vishal Ashruba dongre<sup>3</sup>, Shaikh M Zhainuddin<sup>4</sup>, Sabahat Khanum<sup>5</sup>, Dr. Kavita Kulkarni<sup>6</sup><sup>1\*, 2, 3</sup> Student, Shri Sai Institute of Pharmacy and Research, Chh. Sambhajinagar, Maharashtra, India<sup>4,5</sup> Assistant Professor, Shri Sai Institute of Pharmacy and Research, Chh. Sambhajinagar, Maharashtra, India<sup>6</sup> Principal, Shri Sai Institute of Pharmacy and Research, Chh. Sambhajinagar, Maharashtra, India**Abstract:**

Oral dosage forms are the most popular way of taking medication, despite having some disadvantages compared with other methods like risk of slow absorption of the medicament, which can be overcome by administering the drug in liquid form, therefore, possibly allowing the use of a lower dosage. However, instability of many drugs in liquid dosage form limits its use. Effervescent technique can be used as alternate to develop a dosage form which can accelerate drug disintegration and dissolution, is usually applied in quick release preparations.

Ascorbic acid (vitamin C) is a potent antioxidant, and the human body cannot synthesis it, so ascorbic acid can be obtained from external sources as food and pharmaceutical products.

Grapes seed extract having The Power of Antioxidants on Aging. As you grow older, your skin begins to lose its elasticity. Healing & Calming Actives. Anti-Aging Skincare. Grape seed extracts contain an abundant number of polyphenols.

**Keywords:** Effervescent Tablet, Floating Delivery System, Ascorbic Acid

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Please cite this article in press Revati Rajesh Hiwarale et al., *Review Of Effervescent Powder For Glowing Skin*, Indo Am. J. P. Sci, 2025; 12(11).

## INTRODUCTION:

Ascorbic acid (vitamin C) is a water-soluble vitamin and possesses a potent antioxidant activity. Vitamin C presents naturally in Citrus and most of fruits and vegetables. It has many functions like protects against respiratory tract infections and reduces risk for cardiovascular diseases and even Cancer. Moreover, the processes of collagen synthesis and iron absorption are enhanced in presence of vitamin C on the other hand, when no intake of vitamin C, deficiency vitamin C diseases will occur that named scurvy, the scurvy manifestations are bleeding gums and increased hemorrhage potential due to blood capillaries fragility, in addition to tired feeling and psychological issues like depression, hysteria, and social introversion.

Effervescent tablets are becoming increasingly popular in a variety of sectors including supplements and pharmaceutical use due to the ease in which they can be consumed. Effervescent tablets are designed to break in contact with liquid such as water or juice, often causing the tablet to dissolve into a solution.

Effervescent or carbon tablets are tablets which are designed to dissolve in water, and release carbon dioxide. They are products of compression of component ingredients in the form of powders into a dense mass, which is packaged in blister pack, or with a hermetically sealed package with incorporated desiccant in the cap. To use them, they are dropped into water to make a solution.

The powdered ingredients are also packaged and sold as effervescent powders or may be granulated and sold as effervescent granules. Generally powdered ingredients are first granulated before being made into tablet.

Effervescent tablets are designed to break in contact with liquid such as water or juice, often causing the tablet to dissolve into a solution. This makes effervescent tablets the preferred choice of many, including people who are taking tablets medicinally as well as a dietary supplement. Aloe vera constitutes a large percentage of water, which makes it an excellent hydrating agent for your dry and dull-looking skin. The salicylic acids present in aloe vera work to unclog your skin pores which is necessary to manage acne. The anti-bacterial and anti-inflammatory properties of aloe Vera control the infection, reduce inflammation and redness caused by acne.

### Classification of Effervescent powder

1. Effervescent powder can be divided into four categories.
2. Tea effervescent powder
3. Fruit and vegetable effervescent powder
4. Vitamin effervescent powder
5. trace element supplement effervescent

powder

## METHODOLOGY:

This study was divided into two parts. The effect of different percentages of citric acid and sodium bicarbonate on the effervescent tablet was studied in the first part of the study. The second part of the study was to formulate effervescent tablet with different percentages of sodium starch glycolate which acted as superdisintegrant. The effervescent tablets were evaluated based on their hardness, disintegration time, percentage of weight loss, uniformity in weight and thickness.

### Key evaluation parameters

**Hardness:** the mechanical strength of the tablet, typically measured with a hardness tester (e.g., the force needed to break the tablet).

**Disintegration time:** time taken for the tablet to break apart (or fully dissolve/disintegrate) under specified test conditions.

**Percentage of weight loss:** often used in effervescent tablets to measure CO<sub>2</sub> release (the effervescent reaction will cause mass loss), or possibly moisture or volatile loss during processing-context suggests effervescence-related weight change.

**Uniformity in weight:** tablets weighed individually to assess variability and meet pharmacopeial limits.

**Thickness:** measurement of tablet thickness to ensure consistent size/shape and to correlate with compression behavior and tablet integrity. The lifting phenomenon depends on:

Chemical reaction rate Determines how quickly gas is produced.

Bubble nucleation rate & size evolution

More bubbles

greater effective volume greater buoyancy.

Geometry of the tablet

Surface area

Thickness

Volume

These affect how many bubbles can attach and how fast the mass decreases.

The Toy Mathematical Model

### Key components

#### Buoyancy B(t)

$$B(t) = \rho_{\text{water}} g V_{\text{eff}}(t)$$

$$V_{\text{eff}}(t) = V_{\text{tablet}}(t) + V_{\text{bubbles}}(t)$$

#### Weight W(t) $W(t) = m(t) * g$

$$m(t) = m_{\{0\}} - kt$$

**Bubble volume growth** Assumed proportional to exposed surface area:

$$V_{\text{bubbles}}(t) = as(t)t$$

**Geometry evolution** Tablets are often approximated as cylinders:

Radius **r**

Thickness **h**

During dissolution:  $S(t) \propto r(t)h(t)$

$S(t) = S_0 = \text{constant}$

### Conditions for lifting

The lifting time  $t_z$  is obtained by solving:

$$B(t) = W(t)$$

Substituting model expressions results in a formula of the form:  $tL f(\text{geometry}) g(\text{reaction parameters})$

In Koimas' simplified case, the final formula relates lifting time to tablet surface-to-volume ratio, which controls both gas production and dissolution rate:

$$t_1 \propto V_0 / S_0$$

Thinner tablets (larger surface area) lift faster.

More compact tablets (smaller surface area) lift slower.

Oral dosage forms are the most popular way of taking medication, despite having some disadvantages compared with other methods like risk of slow absorption of the medicament, which can be overcome by administering the drug in liquid form, therefore, possibly allowing the use of a lower dosage. However, instability of many drugs in liquid dosage form limits its use. Effervescent technique can be used as alternate to develop a dosage form which can accelerate drug disintegration and dissolution, is usually applied in quick release preparations. Along with the development of new pharmaceutical technique, effervescent tablet are more and more extensively to adjust the behavior of drug release, such as in sustained and controlled release preparations, pulsatile drug delivery systems, and so on ....

This effervescent reaction offers several advantages:

Rapid disintegration - The evolution of gas breaks the tablet apart quickly.

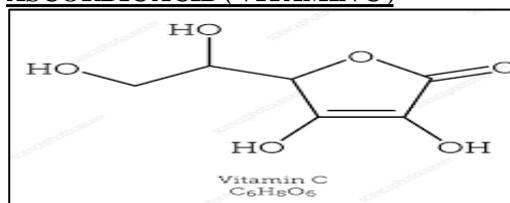
Enhanced dissolution - Faster

Disintegration leads to quicker dissolution of the drug.

Improved bioavailability - Because the drug dissolves rapidly, absorption may be enhanced.

### DRUG EXCIPIENTS PROFILE

#### ASCORBIC ACID (VITAMIN C)



Ascorbic acid is an organic compound with formula  $C_6H_8O_6$ , originally called hexuronic acid. It is a white solid, but impure samples can appear yellowish. It dissolves well in water to give mildly acidic solutions. It is a mild reducing agent.

#### GRAPESSEED EXTRACT

Grape seed extract (GSE) is a dietary supplement made by removing, drying, and pulverizing the bitter-tasting seeds of grapes. Grape seeds are rich in antioxidants, including phenolic acids, anthocyanins, flavonoids, and oligomeric proanthocyanidin complexes (OPCs). In fact, GSE is one of the best-known sources of proanthocyanidins.



Fig. Grape seed extract

#### ALOE VERA

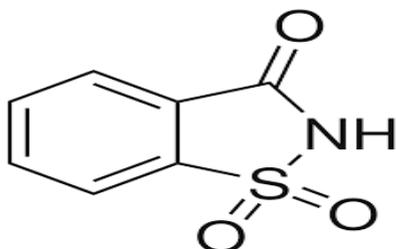
Aloe vera is a succulent plant species of the genus Aloe. Having some 500 species, Aloe is widely distributed, and is considered an invasive species in many world's regions. It is used in many consumer products, including beverages, skin lotion, cosmetics, ointments or in the form of gel for minor burns and sunburns.

Fig. Aloe vera plant



**SODIUM SACCHARIN**

Saccharin is an artificial sweetener with effectively no food energy.

**Structure**

**Chemical formula:**  $C_7H_5NNaO_3S$

**Molar mass:** 206.18g/mol

Uses:

Saccharin is an artificial sweetener, Sodium saccharin can be used for food, such as cold drinks, beverages, jelly, popsicles, pickles

Sweetening Agent – Provides sweetness without adding calories.

Taste Masking – Masks unpleasant or bitter taste of active ingredients.

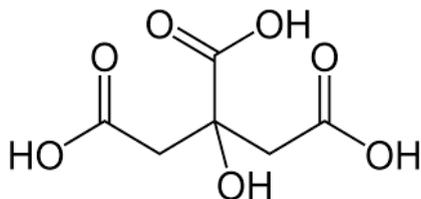
Stability – Chemically stable in dry effervescent formulations.

Low Dosage Requirement – Effective in small amounts, preserving the effervescent reaction.

Non-Cariogenic – Does not promote tooth decay, suitable for oral health products.

**CITRIC ACID**

Structure :-



Citric acid is an organic compound with chemical formula

$HOC(CO_2H)(CH_2CO_2H)_2$ .

It is a colourless weak organic acid.

**Molar mass:** 192.12 g/mol

**Uses :-** Uses of Citric Acid

It is used as an antioxidant

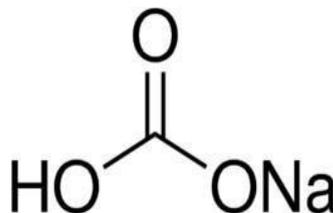
It is used as a cleaning agent – as an ingredient in kitchen and bathroom cleaning solution

It is used as an emulsifying agent in ice creams

It is used to add a sour taste to soft drinks and other food item

**SODIUM BICARBONATE**

Structure: -



**Chemical formula:** -  $NaHCO_3$

**Molar Mass:** - 84.01 g/mol

Uses :-

It is used as pest control to kill cockroach and controlling fungal growth

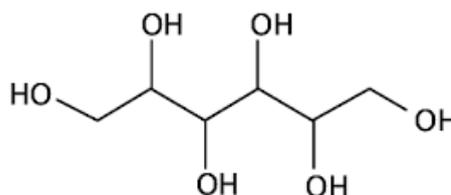
It is as a disinfectant

It is used to protect armpits from bad smell and irritation

It is used in cooking especially to bake food items

**MANNITOL**

Structure :-



**Chemical Formula:** -  $C_6H_{14}O_6$

**Molar Mass:** - 182.17g/mol

Uses: -

It is used in cyanide poisoning as an antidote.

It is used to measure extracellular body fluid as well as to measure the renal glomerular filtration rate.

Used as treatment of calciphylaxis in haemodialysis.

It is used during cardiopulmonary bypass

Materials Use in Manufacturing of effervescent powder

Sr. No.	Ingredient	Function	Quantity (per dose)
1	Citric acid	Acid (effervescence)	2.5g
2	Sodium bicarbonate	Base (effervescence)	5.5g
3	Ascorbic acid	Active ingredient (vit.C)	2g
4	Aloe Vera extract	Digestive support	10g
5	Sucralose	Sweetener	5g
6	Grapes seed	Antioxidant	20g
7	Mannitol	Filler/sweetener	5g

Apparatus used in preparation of effervescent powder

Mortar and pestle

Sieve

Mixing bowl

Weighing balance

Airtight containers

Effervescent powder preparation procedure

**Weighing:** Accurately weigh all ingredients based on the formulation.

**Drying (if needed):** If citric acid monohydrate is used, dry it gently at 50–60°C to avoid premature reaction.

**Powdering and Sieving:** Grind each ingredient (if necessary) and pass through a sieve (e.g., mesh #60) for uniform particle size.

**Blending:** Mix citric acid and tartaric acid thoroughly. Then add sodium bicarbonate and mix well using a gentle rolling motion to avoid initiating the reaction. Add any flavors or sweeteners at this stage.

**Packaging:** Immediately pack the powder into dry, airtight containers to prevent moisture absorption and premature effervescence.

**Notes:** Always use anhydrous conditions to avoid triggering the effervescent reaction. Store in a cool, dry place.

### EVALUATION TEST PROCEDURE

**Description Purpose:** To observe the appearance (color, texture, uniformity).

**Procedure:** Visually inspect the powder for homogeneity, presence of clumps, or discoloration.

**Identification Tests Purpose:** To confirm the presence of active ingredients.

**Procedure:** Use techniques such as IR spectroscopy, UV spectroscopy, or specific chemical reactions, depending on the active ingredients.

**pH of Solution Purpose:** To ensure the solution has an acceptable pH after dissolution.

**Procedure:** Dissolve a specified amount in a given

volume of water (e.g., 1g in 100 mL). Measure the pH using a calibrated pH meter.

**Effervescence Time (Disintegration Test) Purpose:** To determine the time required for complete effervescence.

**Procedure:** Place a known quantity in 200 mL of water at 25°C. Record the time until complete cessation of effervescence (no visible bubbles).

**Flow Properties Tests:** Angle of repose, bulk density, tapped density, Carr's index, Hausner ratio.

**Purpose:** To evaluate flow characteristics which affect packaging and uniformity

**Procedure:** Use standard methods like funnel flow for angle of repose.

Use a tapped density tester for bulk and tapped density measurements.

**Moisture Content Purpose:** To ensure stability and avoid premature reaction.

**Procedure:** Use Karl Fischer titration or a moisture analyzer (LOD method). To verify the correct dosage.

**Stability Testing Purpose:** To ensure product integrity over time.

### Advantages of Effervescent

Effervescent have following advantages

I. The major advantage of effervescent powder is that it is easily dissolved and exact doses can rapidly obtain to the patients.

Efficiency powder is most useful for people suffering from dehydration, as it quickly rehydrates the body by releasing electrolytes.

Efficiency tablets may be more attractive to the consumer than traditional dosage forms.

It may formulate with a large amount of active ingredients as compared to the powder and capsule dosage form.

An effervescent powder does not have an issue of unpleasant taste and odor of the drug, since it masks the unpleasant taste characteristics of the drug and it is administered.

### DISADVANTAGES OF EFFERVESCENT

1. The major disadvantage of the effervescent powder is that it requires expensive excipients, a complex production

process, specialist packaging materials, and the need for larger powder.

2. It is not suitable for patients with heart failure or cardiac insufficiency since has a high amount of sodium or potassium.
3. It is an expensive product compared to conventional powder because most of the materials used are relatively costly.
4. The active pharmaceutical ingredients (API) that have an unpleasant taste and smell can be difficult to formulate.

Here we look at 5 benefits of effervescent powder over regular powder.

#### **Pleasant Taste Compared to Regular powder.**

Effervescent powder is so popular due to the fact they can be dissolved in a liquid such as water or



fruit juice, meaning that they often taste better than regular tablets. Conventional tablets dissolve slowly which can result in reduced absorption rates, effervescent tablets, in contrast, dissolve quickly and completely, meaning you get the full benefit from the ingredients

#### **Distributed More Evenly**

Conventional powder dissolves gradually in the stomach once ingested and can sometimes only partially dissolve which can lead to irritation in some cases. The benefit of effervescent tablets is that they dissolve completely and evenly meaning that localised concentrations of the ingredients cannot occur. This means not only a better taste but also less chance of irritation and a more efficient means of ingesting the ingredients.

#### **Increased Liquid Intake**

Effervescent powder provides the nutritional benefits intended, but in addition to this they also increase liquid intake. This can be especially beneficial if you are dehydrated or ill and not ingesting as much fluid as usual. Effervescent tablets can be a fantastic way of rehydrating as well as reaping the benefit you are taking powder for whether this is a dietary supplement, herbally or medicinally.

#### **Easy Alternative to Regular powder**

They can be a great alternative for those who may have trouble swallowing either due to illness or age. Older individuals may have difficulty swallowing but need to take medication or supplements on a regular basis and in this respect, effervescent tablets can be a lot easier than having to swallow a powder. In addition to this, they can be a great way of

ingesting medicine for individuals with sore throats or medical issues that make swallowing difficult and so are a viable alternative to regular powder.

#### **Simple and Easy to Measure**

Effervescent powder is easily dissolved into water or a liquid of your choice and then after a while are consistent, well mixed and ready to drink. Traditional tablets or powders, however, need to be measured and stirred in repeatedly to avoid an inconsistent drink with lumpy bits.

#### **To Sum Up**

Effervescent powder is becoming increasingly popular and it is easy to see why. They provide a much more efficient way of taking supplements or medication due to being distributed evenly and much more quickly than regular tablets. In addition to this, they taste better as can be added to water or a liquid drink of your choice as well as being easier to take for people who may find it difficult to swallow.

### **RESULT AND DISCUSSION:**

Collection of ingredients

Ingredients were taken in the required quantity.

#### **Preparation of powder**

Citric acid, Sodium bicarbonate, Ascorbic acid, Aloe vera extract

, Sucralose, Grapes seeds, Mannitol were mixed in the mortar and pestle.

Until it becomes a fine powder to mix it properly.

#### **Fig. Effervescent Powder**

### **CONCLUSION:**

Present study may be considered as a model study to identify and understand the effect of critical formulation parameters on desired product quality attributes for selected formula. Citric acid (anhydrous) and sodium bicarbonate were selected to have a most critical effect on the quality attributes i.e. DT, PH, TP and CO<sub>2</sub> number of effervescent granules. Present study strongly supports the assertions that the formulation of plant extracts into suitable and appropriate herbal dosage form may be more desirable, advantageous and therapeutically more beneficial than incorporating the direct plant material/isolated phytoconstituents.

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