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(In This Issue ...)

Effervescent formulation

Fundamentals of
effervescent

Advantages and
disadvantages of using
effervescent

Drug delivery system

Fundamental
methodologies and
advancement

*Types of the effervescent
formulation in the market*



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Effervescent formulation

Effervescent formulation is intended to be dissolved or dispersed in water before administration. which are uncoated tablets that generally contain acid or acid salts (Citric, tartaric, Malic acid or any other suitable acid or acid anhydride) and carbonates or bicarbonates (Sodium, potassium or any other suitable alkali metal carbonate or hydrogen carbonate), which react rapidly in the presence of water by releasing carbon dioxide. Due to liberation in CO₂ gas, the dissolution of API in water as well as taste masking effect is enhanced. Effervescent formulations are becoming increasingly popular in a variety of sectors including supplements and pharmaceutical use due to the ease in which they can be consumed. They are designed to break in contact with liquid such as water or juice, often causing the tablet to dissolve into a solution.



FUNDAMENTALS OF EFFERVESCENTS:

Effervescence consists of a soluble organic acid and an alkali metal carbonate salt, one of which is often the API. Carbon dioxide is formed if this mixture comes into contact with water. Typical examples of the acids and alkalis used include:

- Acids : as citric acid , Tartaric acid , Malic acid , Fumaric acid and Adipic acid .
- Alkalizes : as Sodium bicarbonate , Sodium carbonate ,and Potassium bicarbonate and carbonate .

ADVANTAGES OF EFFERVESCENT TABLETS:

- ✓ Fast onset of action.
- ✓ No need to swallow tablet.
- ✓ Good stomach and intestinal tolerance.
- ✓ More portability.
- ✓ Improved palatability.
- ✓ Superior stability.
- ✓ More consistent response.
- ✓ Incorporation of large amounts of active ingredients.
- ✓ Accurate Dosing.

- ✓ Improved Therapeutic Effect.
- ✓ In remote areas, especially where parenteral forms are not available due to prohibitive cost, lack of qualified medical staff, effervescent tablets could become an alternative.

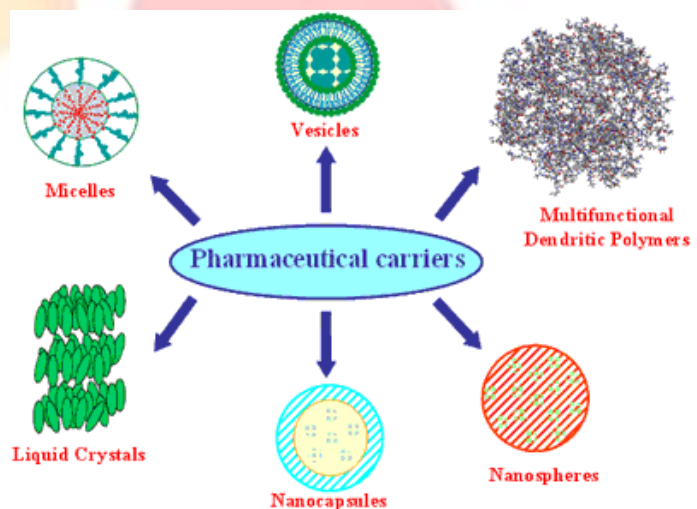
DISADVANTAGES OF EFFERVESCENT TABLETS:

- ✓ Unpleasant taste of some active ingredients.
- ✓ Larger tablets requiring special packaging materials.
- ✓ Relatively expensive to produce due to large amount of more or less expensive excipients and special production facilities.
- ✓ Clear solution is preferred for administration, although a fine dispersion is now universally acceptable

Drug delivery system

Oral drug delivery has been known for decades as the most widely utilized route of administered among all the routes that have been employed for the systemic delivery of drug via various pharmaceutical products of different dosage forms. The reasons that the oral route achieved such popularity may be in part attributed to its ease of administration. Oral sustained drug delivery system is complicated by limited gastric residence times (GRTs). Rapid GI transit can prevent complete drug release in

the absorption zone and reduce the efficacy of the administered dose. These buoyant delivery systems utilize matrices prepared with sellable polymers such as Methocol or poly saccharides, e.g., chitosan, and effervescent components, e.g., sodium



bicarbonate and citric or tartaric acid⁶ or matrices containing chambers of liquid that gasify at body temperature. Flotation of a drug delivery system in the stomach can be achieved by incorporating a floating chamber filled with vacuum, air or an inert gas⁹. Gas can be introduced into the floating chamber by the volatilization of an organic solvent (e.g. Ether or cyclopentane) or by the CO₂ produced as a result of an

effervescent reaction between organic acids and carbonate–bicarbonate salts. The matrices are fabricated so that upon arrival in the stomach, carbon dioxide is liberated by the acidity of the gastric contents and is entrapped in the jellified hydrocolloid. This produces an upward motion of the dosage form and maintains its buoyancy. A decrease in specific gravity causes the dosage form to float on the chyme. Recently a multiple-unit type of floating pill, which generates carbon dioxide gas, has been developed. The system consisted of sustained- release pills as seeds surrounded by double layers. The inner layer was an effervescent layer containing both sodium bicarbonate and tartaric acid. The outer layer was a swellable membrane layer containing mainly polyvinyl acetate and purified shellac. Moreover, the effervescent layer was divided into two sub layers to avoid direct contact between sodium bicarbonate and tartaric acid. Sodium bicarbonate was contained in the inner sub layer and tartaric acid was in the outer layer. When the system was immersed in a buffer solution at 37°C, it sank at once in the solution and formed swollen pills, like balloons, with a density much lower than 1 g/ ml. The reaction was due to carbon dioxide generated by neutralization in the inner effervescent layers with the diffusion of water through the outer swellable membrane layers.

Benefits of effervescent tablets over regular tablets

Pleasant Taste Compared to Regular Tablets

Effervescent tablets are 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. Effervescent tablets, in contrast dissolve quickly and completely, meaning you get the full benefit from the ingredients.

Distributed More Evenly

Conventional tablets dissolve 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 localized concentrations of the ingredients cannot occur.

Increased Liquid Intake

Effervescent tablets provide 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.

Easy Alternative to Regular Tablets

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 tablet. 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 tablets.

Simple and Easy to Measure

Effervescent tablets are 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. Even with stirring and measuring it is common to have an inconsistent drink with lumpy bits and an odd taste and this is where effervescent tablets are more efficient. Simply drop them in and they dissolve fully and evenly ensuring you get all the benefits of the tablet, as well as being able to comfortably drink it.

To Sum Up

Effervescent tablets are 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.

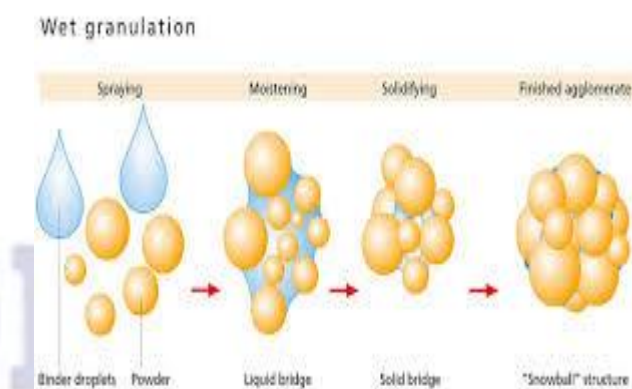
FORMULATION METHODOLOGIES:

Wet Granulation:

The most widely used process of agglomeration in pharmaceutical industry is wet granulation. Wet granulation process simply involves wet massing of the powder blend with a granulating liquid, wet sizing and drying.

Important steps involved in the wet granulation

- ✓ Mixing of the drug(s) and excipients.
- ✓ Preparation of binder solution.
- ✓ Mixing of binder solution with powder mixture to form wet mass
- ✓ Drying of moist granules.
- ✓ Mixing of screened granules with disintegrant, glidant, and lubricant.



Advantages

- ✓ Permits mechanical handling of powders without loss of mix quality.
- ✓ Improves the flow of powders by increasing particle size and sphericity.
- ✓ Increases and improves the uniformity of powder density.

Limitation of wet granulation

The greatest disadvantage of wet granulation is its cost. It is an expensive process because of labor, time, equipment, energy and space requirements. Loss of material during various stages of processing.

Dry Granulation:

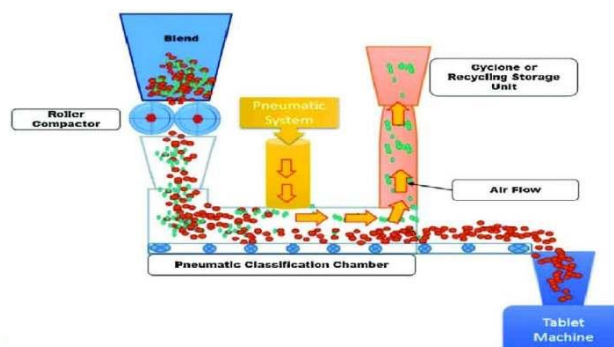
In dry granulation process the powder mixture is compressed without the use of heat and solvent. It is the least desirable of all methods of granulation. The two basic procedures are to form a compact of material by compression and then to mill the compact to obtain a granules. Two methods are used for dry granulation. The more widely used method is slugging, where the powder is recompressed and the

resulting tablet or slug are milled to yield the granules. The other method is to recompress the powder with pressure rolls using a machine such as Chilsonator.

Rollar Compaction:

The compaction of powder by means of pressure roll can also be accomplished by a machine called chilsonator.

Unlike tablet machine, the chilsonator turns out a compacted mass in a steady continuous flow. The powder is fed down between the rollers from the hopper which contains a spiral auger to feed the powder into the



compaction zone. Like slugs, the aggregates are screened or milled for production into granules.⁴⁰⁻⁴³

Use: Use in the production of directly compressible excipients, the compaction of drugs and drug formulations, the granulation of inorganic materials, the granulation of dry herbal material and the production of immediate/sustained release formulations.

Advancement in Granulations

Steam Granulation

It is modification of wet granulation. Here steam is used as a binder instead of water. Its several benefits includes higher distribution uniformity, higher diffusion rate

into powders, more favorable thermal balance] during drying

step, steam granules are more spherical, have large surface

area hence increased dissolution rate of the drug from

granules, processing time is shorter therefore more number of

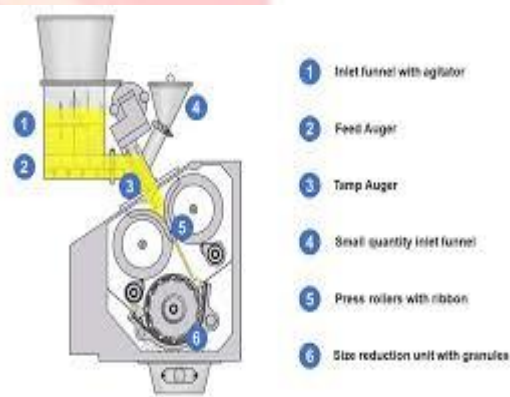
tablets are produced per batch, compared to the use of organic

solvent water vapour is environmentally friendly, no health

hazards to operators, no restriction by ICH on traces left in the granules, freshly distilled steam is sterile and

therefore the total count can be kept under control, lowers dissolution rate so can be used for preparation of

taste masked granules without modifying availability of the drug.



Melt Granulation / Thermoplastic Granulation

Here granulation is achieved by the addition of moldable binder. That is binder is in solid state at room temperature but melts in the temperature range of 50 – 80°C. Melted binder then acts like a binding liquid.

There is no need of drying phase since dried granules are obtained by cooling it to room temperature.

TYPES OF EFFEVERCENT GRANULES IN THE MARKET

DRUG NAME	COMPOSITION	INDICATIONS AND USAGE
UROSOLVINE EFF. GRAN. SACHET	Atropine Sulphate, Colchicine, Piperazine	ANTIGOUT. ANALGESIC
UR-AID EFF GRAN. SACHET	Atropine Sulphate, Colchicine, Piperazine	ANTIGOUT. ANALGESIC
SOLVINAL EFF SACHETS	Atropine Sulphate, Colchicine, Piperazine	ANTIGOUT. ANALGESIC
URICOL PLUS SACHET	Colchicine, khellin, Piperazine citrate	ANTIGOUT. ANALGESIC
UROCOLINE EFF SACHET	Colchicine, Piperazine citrate, Halfa bar extract	ANTIGOUT. ANALGESIC
URIVIN SACHETS	Sulphate, colchicine, khellin, piperazine	URINARY. ANALGESIC.ANTISEPTIC
PROXIMOL COMP. EFF. GRANULES	Hexamine, piperazine, proximadiol	URINARY. ANALGESIC.ANTISEPTIC
COLI-URINAL EFF. GRANULES	Hexamine, piperazine, khellin	URINARY. ANALGESIC.ANTISEPTIC
URICOL EFF GRANULES	Hexamine, piperazine, khellin	URINARY. ANALGESIC.ANTISEPTIC
SEPTOBAR EF. SACHET	Halfa bar extract, hexamine	URINARY. ANALGESIC.ANTISEPTIC
RENAL-S SACHET	Hexamine, piperazine, khellin	URINARY. ANALGESIC.ANTISEPTIC
JEDCORENE EFF. SACHET	Hexamine, piperazine, khellin	URINARY. ANALGESIC.ANTISEPTIC
EPIMAG EFF. GRA. SACHET	Magnesium Citrate	HYPER-OXALURIA. LAXATIVE.ANTACID
MAGNA EFF. GRAN. SACHET	Citric acid, magnesium oxide, saccharin, sodium bicarbonate, sodium carbonate	HYPER-OXALURIA, LAXATIVE

CITROCID MAGNESIUM PLUS EFF. SALT	Magnesium, Citric acid, Vitamin B6	HYPER-OXALURIA, LAXATIVE
XENOMAG EFF. GRAN. SACHET	Citric acid, Magnesium carbonate, Sodium bicarbonate	ALKALINIZING AGENT. ANTIOXIDANT PROP. EXPECTORANT
PARAVESENT EFF. SACHET	Metoclopramide, paracetamol	ANTIEMETIC GASTROPROKINETIC AGENT
MAGNESIUM DIASPORAL	Magnesium Citrate	LAXATIVE
ACETYLCYSTEIN SACHET	Acetylcysteine	MUCOLYTIC
ACC.(LONG) EFF. SACHET	Acetylcysteine	MUCOLYTIC
FLUIMUCIL EFF.	Acetylcysteine	MUCOLYTIC
MUCOBRAVE SACHET	Acetylcysteine	MUCOLYTIC
MUCOLATOR SACHET	Acetylcysteine	MUCOLYTIC
ROTACYSTEINE	Acetylcysteine	MUCOLYTIC
WINDY SACHET	Acetylcysteine	MUCOLYTIC
ACETYLCYSTDAR SACHET	Acetylcysteine	MUCOLYTIC
DOWNOPRAZOL SACHET	Omeprazole, sodium bicarbonate	PEPTIC ULCER. PROTON PUMP INHIBITOR
DUDOMEZ SACHET	Omeprazole, sodium bicarbonate	PEPTIC ULCER. PROTON PUMP INHIBITOR
NEXIPRO SACHET	Omeprazole, sodium bicarbonate	PEPTIC ULCER. PROTON PUMP INHIBITOR
OPRANATE SACHET	Omeprazole, sodium bicarbonate	PEPTIC ULCER. PROTON PUMP INHIBITOR
STOMIGAS SACHET	Omeprazole, sodium bicarbonate	PEPTIC ULCER. PROTON PUMP INHIBITOR
ZARROPRAZOLE SACHET	Omeprazole, sodium bicarbonate	PEPTIC ULCER. PROTON PUMP INHIBITOR
ESMORAP SACHET	Esomeprazole	PEPTIC ULCER. PROTON PUMP INHIBITOR

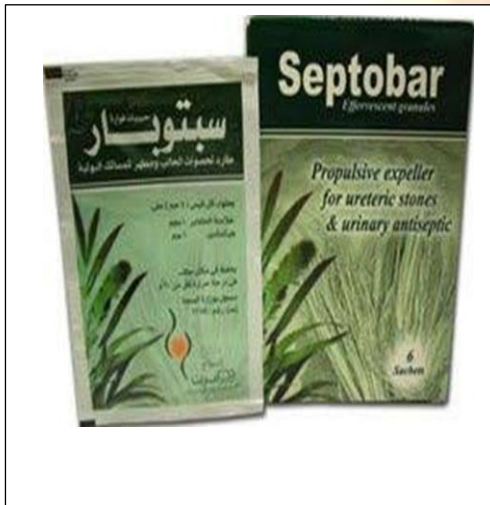
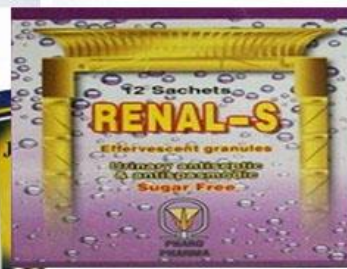
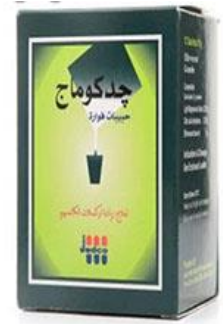
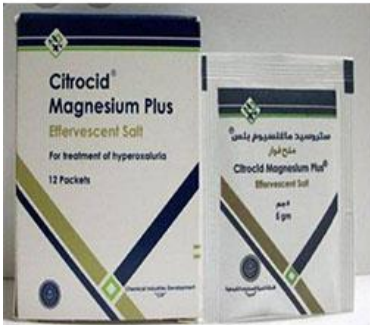
NEXIUM SACHET	Esomeprazole	PEPTIC ULCER. PROTON PUMP INHIBITOR
CATAFAST SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
ACTIFAST SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
ADWIFLAM SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
DECLOPHEN FAST SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
FLASH ACT SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
INESTAFENAC SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
RAPIDINIX SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
DICLOTAZEN SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
DICLOWAD SACHET	Diclofenac potassium	NSAID.ACETIC ACID DERIVATIVES
FLECTOR GRANULES SACHET	Diclofenac Sodium	NSAID.ACETIC ACID DERIVATIVES
BRUFEN SACHET	Ibuprofen	NSAID.PROPIONIC ACID DERIVATIVES
SPIDIDOL EFF. GRAN. SACHET	Ibuprofen	NSAID.PROPIONIC ACID DERIVATIVES
OLOGINT PLUS SACHET	Colostrum, Lactoferrin	IN DIARRHEA. AIRWAY INFECTION. INFLUENZA
ALKA SACHET	Borax, Boric acid, Sodium bicarbonate	ANTIMICROBIAL
ALKA-MISR ALKALINE WASH POWDER SACHET	Borax, Sodium Bicarbonate, Sodium Chloride	NASAL/ VAGINAL WASH
ALKAMENT SACHET	Borax, Sodium Bicarbonate, Sodium Chloride	NASAL/ VAGINAL WASH
ALKAPOWDER ALKALINE POWDER	Sodium Borate, Sodium Bicarbonate, Sodium Chloride	NASAL WASH
ALKALIPURIN GRAN.	Potassium Sodium Hydrogen Citrate	NEPHROLITHASIS. URINARY ALKALINIZER

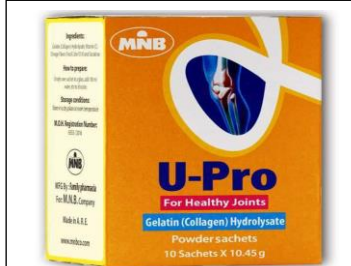
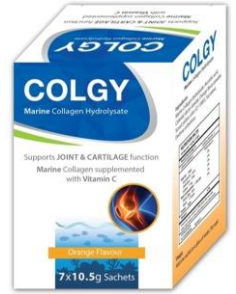
ACTI-COLLA-C SACHET	Gelatin(collagen) hydrolysate, Vitamin C, Rosehip Extract	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
CH-ALPHA (PLUS) SACHET	Gelatin(collagen) hydrolysate, Vitamin C, Rosehip Extract	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
GINIPIN SACHET	Collagen, Vitamin E, Vitamin C, Calcium, Magnesium	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
JONMERA SACHET	Gelatin(collagen) hydrolysate, Vitamin C	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
GELATEXIN ORAL POWDR SACHET	Gelatin(collagen) hydrolysate, Vitamin C	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
NEW GELTA ORAL POWDER SACHET	Gelatin(collagen) hydrolysate	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
UNI ALPHA ORAL POWDER SACHET	Gelatin(collagen) hydrolysate, Vitamin C	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
LAMAZI COLLAGEN	Gelatin(collagen) hydrolysate, Vitamin C	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
CARTINO SACHET	Gelatin(collagen) hydrolysate, Vitamin C	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
LUDAGEN SACHET	Collagen, Calcium, Vitamin D, Hydroxy Apatite, Vitamin K2, Magnesium, Vitamin C	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
RIGIDO SACHET	Lactoferrin, C-Phycocyanin, Promelain, Chymotrypsin	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
TIGINT PLUS SACHET	Gelatin(collagen) hydrolysate, Lactoferrin	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS

CONJU SACHET	Gelatin(collagen) hydrolysate, Vitamin C, Calcium Citrate, Magnesium citrate	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
GENANU SACHET	Gelatin(collagen), Calcium Carbonate, Magnesium, Calcium Ascorbate, Vitamin E, Sucralose	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
ROSNUM SACHET	Gelatin(collagen) hydrolysate, Vitamin C,D , Calcium	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
COLLAGIX SACHET	Gelatin(collagen) hydrolysate, Vitamin C	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
DULAGEN SACHET	Gelatin(collagen) hydrolysate, Vitamin C	ANTI-RHEUMATIC. OSTEOARTHRITIS. ANABOLIC AGENTS
BRONCHO-VAXOM CHILDREN SACH.	Bacterial Lysate	IMMUNOSTIMULANT
IMMUBUILD SACHET	Vitamins, Minerals, Amino Acids, Proteins	IMMUNOSTIMULANT
IMMUGUARD SACHET	High conc. Bovine Colostrum, Vitamins, Minerals	IMMUNOSTIMULANT
DULEFER SACHET	Lactoferrin	IRON SUPPLEMENT
DRAVO SACHET	Lactoferrin	IRON SUPPLEMENT
NATROL SACHET	Lactoferrin	IRON SUPPLEMENT
ORAVAR SACHET	Lactoferrin	IRON SUPPLEMENT
PRAVOTIN SACHET	Lactoferrin	IRON SUPPLEMENT
VERONY SACHET	Lactoferrin	IRON SUPPLEMENT
PALMEFER SACHET	Lactoferrin, Ferrous Fumarate, Vitamin (B12,B1,B6,C), Folic acid	IRON SUPPLEMENT
VITOSEL SACHET	Lactoferrin, Ferrous Fumarate, Colostrum, Vitamins	IRON SUPPLEMENT
FROSTATEC SACHET	Lactoferrin, Ferrous Fumarate, Vitamin (B12,B1,B6,C), Folic acid	IRON SUPPLEMENT
INNOCAL SALCIUM SACHET	Lactoferrin, Vit. D3, Magnesium, Calcium, lecithin, Whey Protein	IRON SUPPLEMENT



فوارات الأملاح







Note that

- ✓ Use 100 to 150 ml cold or warm water, and don't drink until the tablets completely dissolved or air bubbles totally disappear.
- ✓ Avoid children to medicate the tablets by themselves. It is strictly forbidden to put effervescent tablets into mouth directly.
- ✓ If there is any floc, precipitation or insoluble substance appears in the solution, do not take it.
- ✓ Effervescent medicines should be sealed and prevented from heat or moisture during storage.
- ✓ Don't take the tablets together with other drugs.

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