

CHAPTER – 3D Pharmaceutical Chemistry

Topic: DENTAL PRODUCTS

3D.1

INTRODUCTION

The substances used to produce effect on teeth and in dental cavity is called as dental products. E.g. Sodium fluoride.

3D.2

Type of Dental Products

1. Anti caries agent: - Dental caries is a disease of teeth caused by acids formed by action of microorganism on carbohydrate and it is characterized by decalcification of tooth and foul mouth odour. Anticaries agents help in the prevention of dental caries. **e.g.** Sodium fluoride, Stannous fluoride.

2. Cleaning agent: - It helps to remove stains from teeth and gives abrasiveness. **e.g.** Dibasic calcium phosphate, sodium metaphosphate

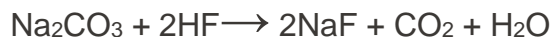
3. Polishing agent: - It gives whiteness to the teeth. **e.g.** sodium metaphosphate, Calcium carbonate, Calcium pyrophosphate

4. Desensitization agents: - It reduces the sensitivity of teeth to hot and cold. **e.g.** Zinc chloride, Strontium chloride

3D.3

Sodium Fluoride (NaF)

Method of Preparation: By passing hydrogen fluoride into solution of sodium carbonate.



Physical Properties:

- ❖ Colorless powder
- ❖ Odourless
- ❖ Salty taste
- ❖ Soluble in water
- ❖ Insoluble in alcohol.

Uses:

1. Anticaries agent
2. Prophylaxis of dental caries.

3. Manufacturing of dental products.
4. Used for preparation of insecticides and rodenticides.

Storage: "It should be stored in well closed container at a cool place."

3D.4

Stannous Fluoride (SnF₂)

Syn: Tin fluoride

Method of Preparation: By mixing stannous oxide with hydrofluoric acid.

**Physical Properties:**

- ❖ Colorless powder
- ❖ Odorless
- ❖ Salty taste
- ❖ Soluble in water
- ❖ Insoluble in alcohol
- ❖ Insoluble in ether.

Uses:

1. Anti caries agent
2. Prophylaxis of dental caries.
3. Manufacturing of dental products.

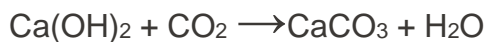
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3D.5

Calcium Carbonate (CaCO₃)

Syn: Precipitated chalk.

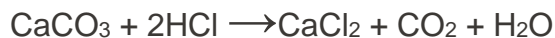
Method of Preparation: Prepared by passing Carbon dioxide gas through lime water.

**Physical Properties:**

- ❖ Colorless powder
- ❖ Odorless
- ❖ Tasteless
- ❖ Insoluble in water
- ❖ Insoluble in alcohol

Chemical Properties:

1. When it reacts with hydrochloric acid it gives salt and water.



2. When it reacts with sulphuric acid it gives salt & water.

**Uses:**

1. As dental product (polishing agent)
2. Manufacturing of dental products.
3. Antacid
4. Manufacturing of quick lime
5. In agricultural field for neutralization of acid
6. Used as dentifrice

Storage: "It should be stored in well closed container at a cool place."

3D.6

Sodium Meta-phosphate (NaPO₃)

Syn: Grahams salt

Method of Preparation: By dehydration of sodium phosphate.

Physical Properties:

- ❖ Colorless powder
- ❖ Odorless
- ❖ Tasteless
- ❖ Insoluble in water
- ❖ Soluble in mineral salts solution
- ❖ Hygroscopic in nature

Uses:

1. As dental product (polishing agent)
2. Manufacturing of dental products.
3. Used in detergent

Storage: "It should be stored in well closed container at a cool place."

3D.7

Dicalcium Phosphate (CaHPO₄.2H₂O)

Syn: Dibasic calcium phosphate

Method of Preparation: By using calcium chloride and disodium hydrogen phosphate.

Physical Properties:

- ❖ Colorless powder
- ❖ Odorless
- ❖ Tasteless
- ❖ Insoluble in water
- ❖ Insoluble in alcohol
- ❖ Soluble in dilute hydrochloric acid solution

Uses:

1. As dental product (Cleansing agent)
2. Manufacturing of dental products.
3. Used as source of calcium and phosphate

Storage: “It should be stored in well closed container at a cool place.”

3D.7

Strontium Chloride ($\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$)

Method of Preparation: By treating strontium oxide with hydrochloric acid.

Physical Properties:

- ❖ Colorless powder
- ❖ Odorless
- ❖ Tasteless
- ❖ Soluble in water
- ❖ Soluble in alcohol
- ❖ Aqueous solution is neutral in nature.

Uses:

1. As dental product (Desensitizing agent)
2. Manufacturing of dental products.

Storage: “It should be stored in well closed container at a cool place.”

3D.8

Zinc Chloride ($\text{ZnCl}_2 \cdot 6\text{H}_2\text{O}$)

Syn: Butter of zinc

Method of Preparation: By heating metallic zinc with hydrochloric acid.

Physical Properties:

- ❖ White colored powder

- ❖ Odorless
- ❖ Tasteless
- ❖ Soluble in water
- ❖ Soluble in alcohol
- ❖ Soluble in glycerin
- ❖ Aqueous solution is acidic in nature.

Uses:

1. As dental product (desensitizing agent)
2. Manufacturing of dental products.
3. As an astringents
4. Mild antiseptics
5. In manufacturing of fire proof wood.

Storage: "It should be stored in well closed container at a cool place."