



# Dental Material

Gypsum products

M.Sc Sadiq Almayali

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الكورس الثاني



المرحلة الاولى

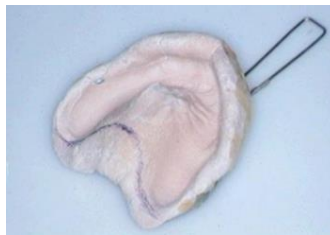
## Gypsum products

### Introduction

Products of gypsum are used widely in dentistry. At first, Gypsum was found in mines around the city of Paris, so it is also called *plaster of Paris* and then gypsum is found in most countries. The mineral gypsum  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$  is usually white to yellowish white in color.

### Application in dentistry

1. Impression plaster used for impressions of the mouth.



2. used to make molds, casts and dies for making restorations.



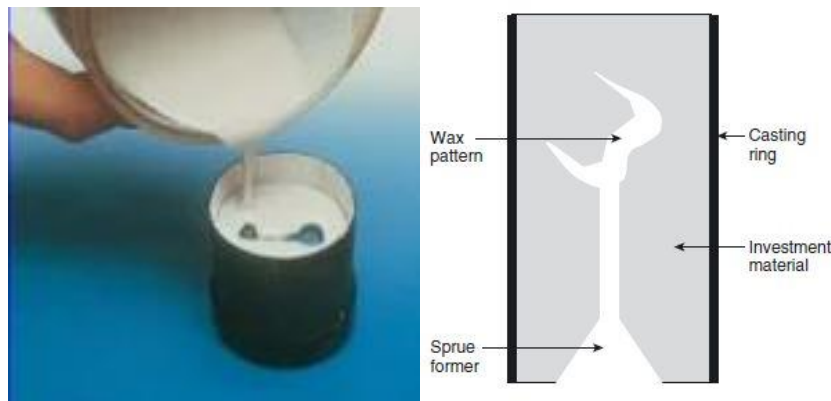
3. To attach casts to an articulator



#### 4. Molds for processing dental polymers.



#### 5. Dental investments: when plaster is mixed with silica it is known as dental investment. They are used to form molds for metal casting.



### Properties of ideal model material

1. Dimensional stability.
2. High strength.
3. Hardness.
4. Reproduce the fine details.
5. Produce smooth surface.
6. Reasonable setting time.
7. Compatible with impression materials.
8. Can be disinfected.

## Types of gypsum products

**Type 1:** Dental plaster for impressions

**Type 2:** Dental plaster for mounting or for models

**Type 3:** Dental stone for models

**Type 4:** Dental stone (high strength, low expansion) for dies

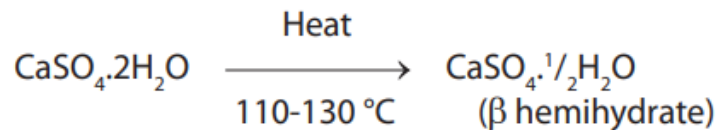
**Type 5:** Dental stone (high strength, high expansion) for dies

## Manufacture of gypsum products

**calcination** it is a process of heating gypsum to produce plaster.

- Mined gypsum is ground and heated. When heated, gypsum (calcium sulphate dihydrate) ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) loses part of its water and changes to calcium sulphate hemihydrate ( $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ ).

**Manufacture of dental Plaster:** it is produced by heating gypsum in open container to (110 – 130 C) which loses water to form plaster ( $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ ). The crystals of plaster are irregular in shape and porous called **Beta-hemihydrate**.



Sadiq Almayali