

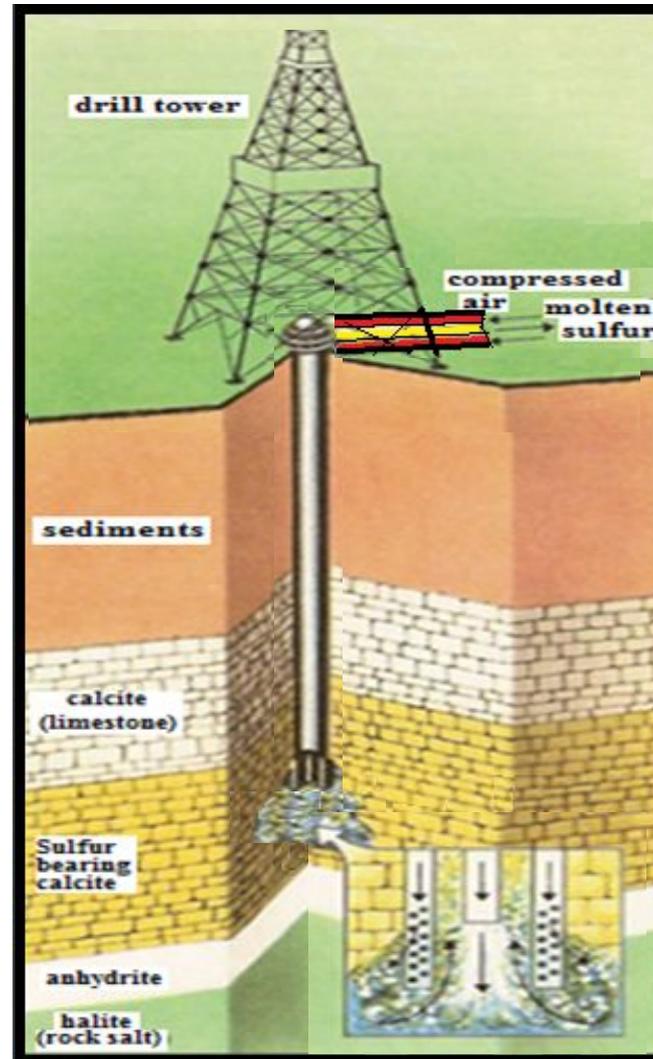
هندسة عمليات إنتاج الكبريت

Engineering of Sulfur Production processes

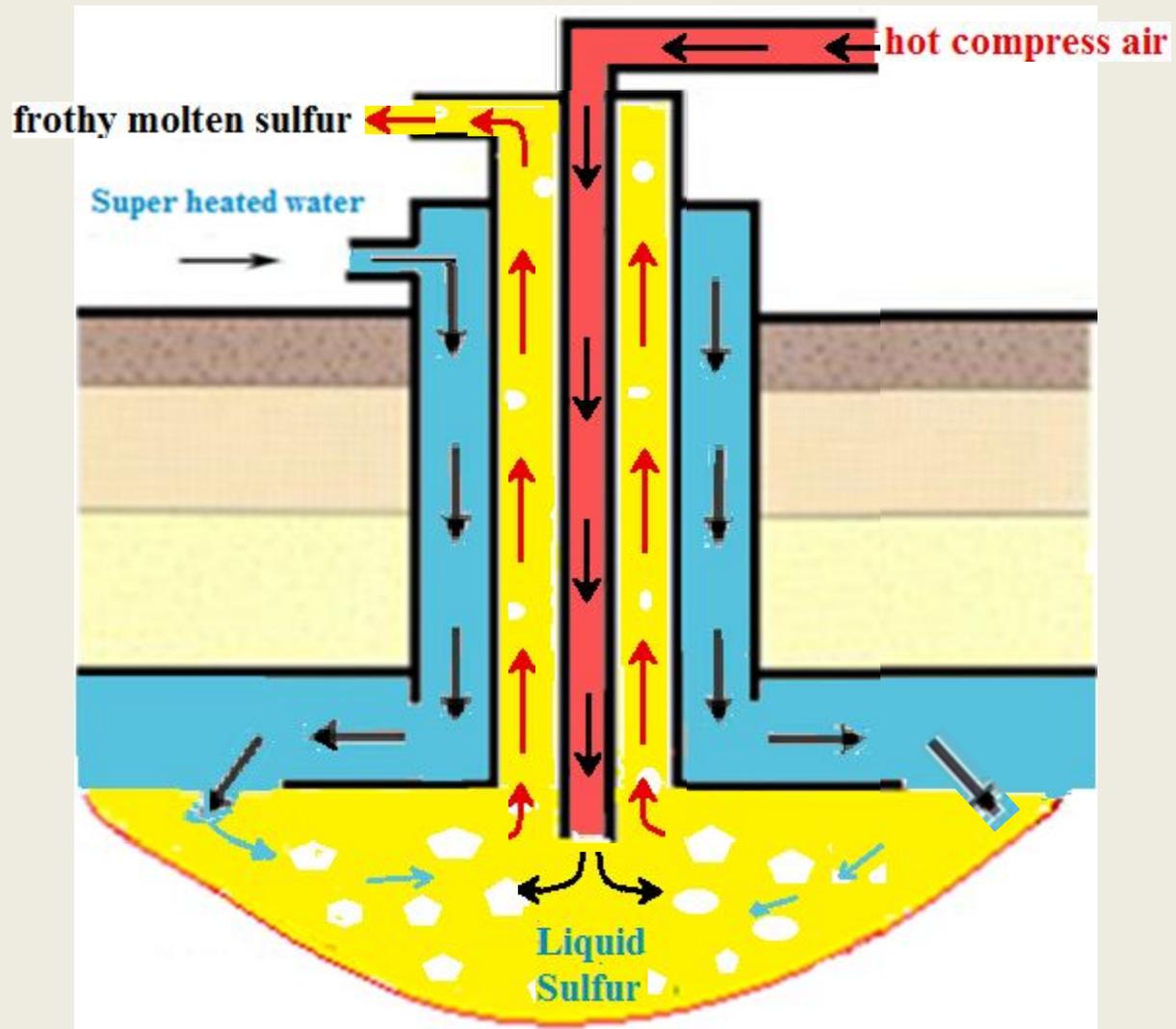
Frasch Method

Frasch sulfur process have proven to be either:
salt domes or bedded **evaporate deposits**

Sulfur bearing deposits
and
Recovery of Sulfur



The Frasch process



Frasch process

The **Frasch sulfur process** only works under very **specific geologic conditions**. It can be used for deposits **50–800 meters deep**. The process has proven to be either **salt domes** or bedded **evaporate deposits** in which permeable native sulfur deposits are enclosed in impermeable formations. The **elemental sulfur** obtained by this process can be very pure (**99.7 - 99.8%**). In this form, it is light yellow in color. If contaminated by organic compounds, it can be **dark-colored**

Frasch process

The description and characteristics of the **Frasch process** is as follows:

- 1- It can be used for deposits **50–800 meters deep**
- 2- the process was applied either on the **salt domes** or bedded **evaporate deposits**
- 3- A **hole** is drilled down to the **sulfur deposit** and in it is inserted a piece of apparatus consisting of **three concentric tubes** see down schematic diagram.
- 4- **Superheated** water is injected directly into the **sulfur-containing mineral strata** (**sulfur** formation), during outermost tube, melting the sulfur all round it
- 5- The temperature of pumped water at about **165°C** and under sufficient **pressure** to keep the water from boiling.

(Because sulfur has a relatively low melting point(m.p.) at **115°C**, it is possible to melt it with **superheated water** which is water that has attained يتحقق من خلال a temperature sometimes above its boiling point **because** it is **under pressure**).

6- **3-38 cubic meters** of **superheated water** are required to **produce every tone** of sulfur depend on the **depth** and **sulfur size**.

7- the **elemental** Sulfur melts (**m.p. 115 °C**) and try to flows into the **middle tube**.

8- **Water pressure** alone is unable to force the sulfur into the surface **due to the molten sulfur's greater density**

9- **hot** compressed **air** pumped down through **innermost tube** (center) to **froth** the sulfur, **making it less dense**, and pushing it to the surface.

10- **Early in the century**, at the point in the process when the sulfur reached the surface, it was **pumped** into wooden forms or molds where it **cooled** and **solidified**.

11- **Modern facilities** use insulated pipes to **move the sulfur to heated storage tanks** where it is **held**.

12- **At last the heated storage sulfur transfer** to a terminal from which it is shipped to customers

13- **when large quantities of excess sulfur are stockpiled**, the molten sulfur is cooled and solidified, **creating huge blocks of solid sulfur** from which the term “**poured صب to block**” is derived

14- The **elemental sulfur** obtained by this process can be very pure (**99.7 - 99.8%**⁵).

