

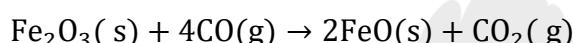
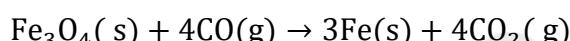
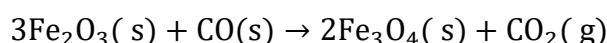
**DPP - 02****SOLUTION**

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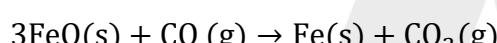
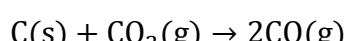
**1. (A)**

In case of Fe, roasting is required to convert  $\text{FeO}$  into  $\text{Fe}_2\text{O}_3$  and formation of slag is prevented by this as only  $\text{FeO}$  forms slag not  $\text{Fe}_2\text{O}_3$ .

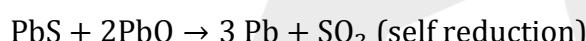
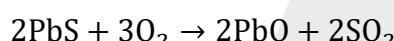
At temperatures 500-800K



In the lower portion of the Blast Furnace (at 900-1500K)

**(B)**

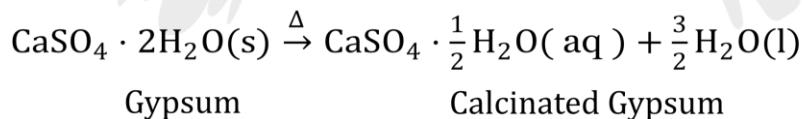
Extraction of Pb from  $\text{PbS}$

**(C)**

The extraction of zinc from zinc blende is carried out by first roasting and then reduction with Carbon. Roasting:  $2\text{ZnS} + 3\text{O}_2 \rightarrow 2\text{ZnO} + 2\text{SO}_2$  :

**2.**

When the gypsum is heated in a controlled environment, it partially loses its water of crystallization and converts into plaster or stucco is called Calcinated Gypsum.

**3.**

Azurite -  $2\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$

Malachite -  $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$

Anglesite -  $\text{PbSO}_4$

Chalcocite -  $\text{Cu}_2\text{S}$



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4. Common thermite contains ferric oxide and aluminium in 3:1 ratio. In Goldschmidt aluminothermic process thermite contains 3 parts of  $\text{Fe}_2\text{O}_3$  and 1 part of Al.
5. Copper, lead are all less electropositive metals and so they can be extracted by self-reduction from their respective sulphide ores. -In the extraction of copper from its sulphide ore, the ore is subjected to partial roasting in air to form its oxide.
6. Roasting is done because it is easier to obtain metals from their oxides (by reduction) than from carbonates or sulphides. So, before reduction can be done, the ore is converted into metal oxide.

Thus, option A is incorrect.

In the process of smelting, of sulphide concentrate sustains high-temperature smelting process mainly from the oxidation of sulphide in the concentrate and the heat in slag.

Thus, option B is incorrect.

All ores are minerals while all minerals are not ores as some of them might have a large amount of unwanted substances such as sand, stones and earthly impurities.

Thus, option C is also incorrect.

Sphalerite, also called blende, or zinc blende, zinc sulfide ( $\text{ZnS}$ ), the chief ore mineral of zinc.

Thus, option D is correct.

7. The reduction reaction of alumina by carbon requires very high temperatures like  $2100^\circ\text{C}$ . Alongside this, aluminum has more affinity towards oxygen atoms than the carbon atoms have towards oxygen. At very high temperature, actually this reaction proceeds but it requires very high amounts of heat hence very costly.
8. (A) - R ; (B) - Q, T (C)- P, T ; (D) - S

#### (A) Froth floatation process:

It is a process of concentrating the ore in which minerals are separated from impurities by adsorbing them from fluid to solid surface.

So adsorption process is used in the froth floatation of ore.

#### (B) Roasting:

- The roasting process occurs in the presence of oxygen.
-



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- The process in which the ores are heated below their melting point in the presence of oxygen.
- The impurities are oxidized to their volatile oxides while the moisture is removed from the ore.
- Sulfide ores are roasted by this method like ZnS.

**(C) Calcination:**

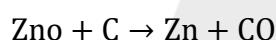
- The calcination process occurs in the absence of oxygen.
- It is the process in which the ore is heated to a high temperature below its melting point in the absence of oxygen
- Moisture is removed from the ore during the calcination process.
- Carbonate ores are calcined by this method like  $\text{ZnCO}_3$

**(D) Hydrometallurgy:**

Hydrometallurgy is a process in which development of ions exchange, solvent extraction and other process has led to extraction of more than 70 metallic elements. Gold and silver are produced using metallurgy recently copper and zinc are also produced.

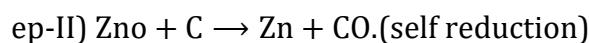
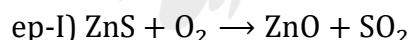
**9. (A)**

calamine ( $\text{ZnCO}_3$ ) is an ore of carbonate



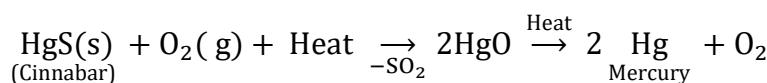
**(B)**

Zinc Blende is Zns is an sulphide ore

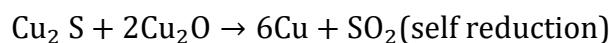
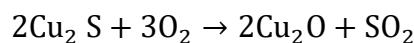


**(C)**

Cinnabar ( $\text{HgS}$ ) is an ore of Mercury.



**(D)  $\text{Cu}_2\text{S}$  (chalcocite) is an copper ore**





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**10. Copper ores:**

Chalcopyrite- $\text{CuFeS}_2$

Azurite -  $2\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$

Malachite -  $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$

**Other ore:-**

Fluorite (also called fluorspar) is the mineral form of calcium fluoride,  $\text{CaF}_2$ .

Magnetite is a mineral and one of the main iron ores, with the chemical formula  $\text{Fe}_3\text{O}_4$

Tincal (or Borax) is an ore of boron. Its formula is  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ .

Sphalerite (sometimes spelled sphalerite) is a sulfide mineral with the chemical formula  $(\text{Zn}, \text{Fe})\text{S}$ . It is the most important ore of zinc.