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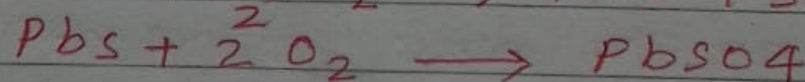
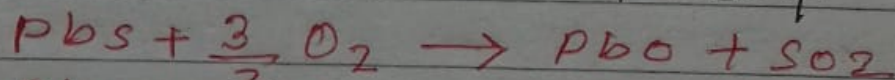
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FOR DEG I CHEMISTRY HONS PAPER I &
DEG I SUB COURSE
LEAD METAL (Pb-METAL) AT NO-82

Extraction :- The chief ore of Lead is Galena (Pbs). As it is sulphide ore the concentration of ore is carried out by froth flotation method.

Sulphide ore comes on the surface of the vessel and then scooped and collected. The gangue settles down on the bottom.

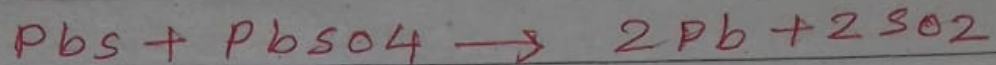
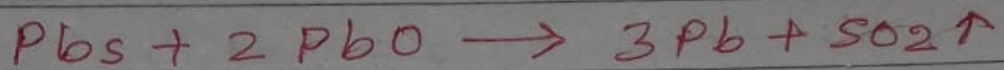
Smelting :- The concentrated ore is incompletely roasted in a reverberatory furnace at a low temperature about 500°C . Heating is done in the excess of air but in such a way that Pbs ore is partially oxidised to PbO and PbSO₄.



Reaction Process :-

~~important~~ Here in the absence of air heating is done so that the unchanged Pbs reacts with PbO and PbSO₄ forming lead metal.

Teacher's Signature



Refining of Lead :-

The crude metal contains impurities like Cu, Ag, Fe, As and S and is refined by the following process:-

Liquation :- The crude Lead is heated on an inclined hearth of a furnace. Lead melts at lower temperature than many of the impurities. At the melting point of Lead (327°C) the molten lead flows down and infusible mass remains ~~remain~~ behind as liquation dross.

Electrolytic refining :-

The electrolytic bath contains Lead fluorosilicate $PbSiF_6$ solution. Pure lead acts as cathode and impure lead as anode.

As a result of electrolysis pure lead is deposited at cathode while impurities are thrown down as anode mud.

Physical Properties :-

Lead is a bluish white metal
 M.P = 327°C Pb is very soft and
 can be rolled into thin sheets.

It can be cut with a knife.
 The hardness is increased by the
 presence of Cu and Sb.

It is not attacked by
 water and acids.

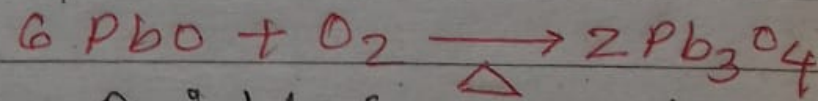
Compounds of Lead :-

The Pb(II) compounds are stable.
 The Pb(IV) compounds are less stable
 and are oxidising agent.

(1) Red Lead (Pb₃O₄)

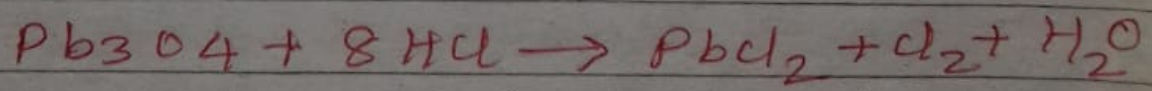
It is mixed oxide of divalent
 and tetravalent Lead $2Pb^{II}O \cdot Pb^{IV}O_2$

When PbO is heated in air
 to about 500°C, a red powder is
 obtained.



It is an oxidising agent,
 because of presence of Pb(IV) and
 oxidises HCl to Cl₂

india

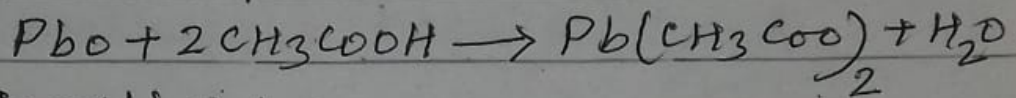


Red lead is used in paints to protect
 metal against corrosion.

(D)

(2) Lead Acetate (sugar of Lead)

PbO is dissolved in acetic acid and the solution is crystallised. Lead acetate $Pb(CH_3COO)_2 \cdot 3H_2O$ crystal separates out.



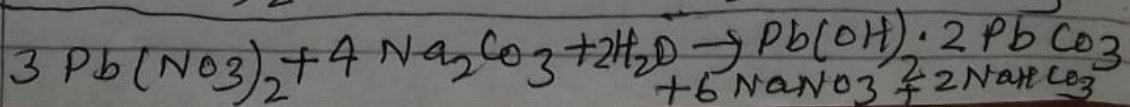
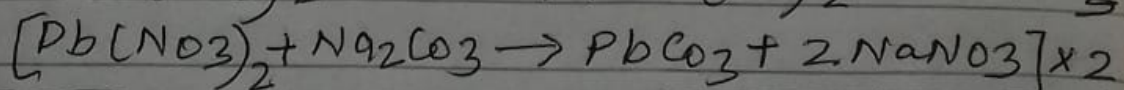
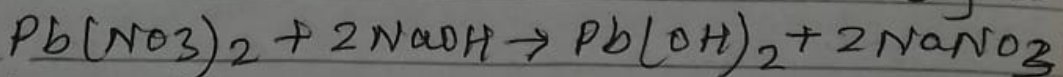
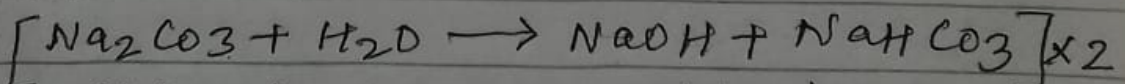
Properties :-

It is poisonous compound. It is soluble in water. Its aqueous solution tastes sweet and so it is called sugar of Lead.

(3) White Lead (Basic Lead carbonate)

Basic Lead carbonate \rightarrow white Lead

When Lead nitrate salt solution is mixed with sodium carbonate solution, a white precipitate of Basic Lead carbonate is obtained.



(E)

White Lead is powder which mix very quickly with oil. It is a very good white pigment. Addition of 20% BaSO_4 increases its covering power.

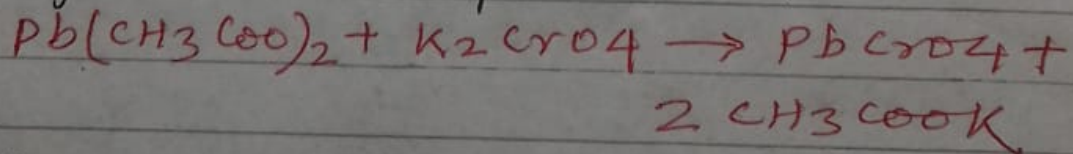
(4) chrome yellow (PbCrO_4) Lead chromate

It is used as yellow pigment. It is insoluble in water but soluble in NaOH or HNO_3 .

For lighter colouration it is mixed with $\text{BaSO}_4 + \text{ZnS}$ (Litho Pone).

It is prepared by mixing potassium chromate solution to lead acetate solution. The solution is acidified with H_2SO_4 .

A yellow ppt of PbCrO_4 is obtained



~~inf~~

The End.