

**GCSE Chemistry A (Gateway Science)**  
**J248/03 C1-C3 and C7 Higher (Higher Tier)**

**Question Set 10**

1 Lead is most commonly extracted from an ore called galena, PbS.

(a) Extracting lead from the galena ore involves two steps.

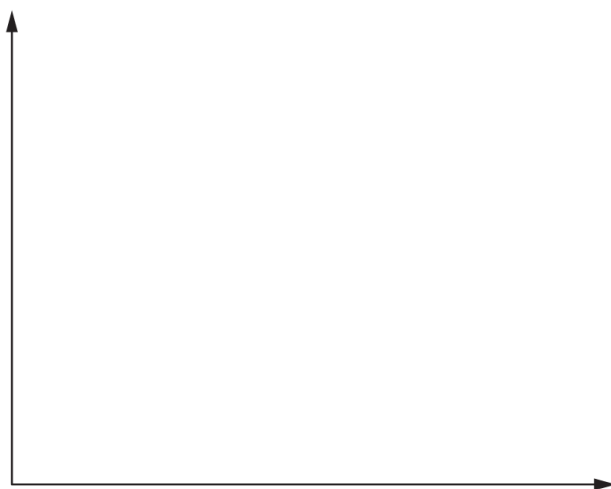
Step 1: The galena ore is roasted in air to produce lead oxide, PbO.

Step 2: The lead oxide is heated in a blast furnace with carbon.

(i) The reaction in step 1 is an **exothermic** reaction.

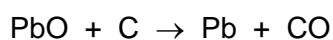
Draw a labelled reaction profile diagram for an exothermic reaction.

Label the **activation energy** and the **energy change** on your diagram.



[4]

(ii) In step 2 the lead oxide is reduced by carbon.



Explain, in terms of electron transfer, why carbon is called a **reducing agent** in this reaction.

[1]

(b) (i) Solid lead reacts with nitric acid, HNO<sub>3</sub>.

Lead nitrate, Pb(NO<sub>3</sub>)<sub>2</sub>, nitrogen oxide, NO, and water are made.

Write a **balanced symbol** equation for this reaction.

[2]

- (ii) How many moles of lead nitrate would be produced if 20.7 g of lead reacts with nitric acid?

Give your answer to 2 significant figures.

Moles of lead nitrate = .....

[4]

**Total Marks for Question Set 10: 11**



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