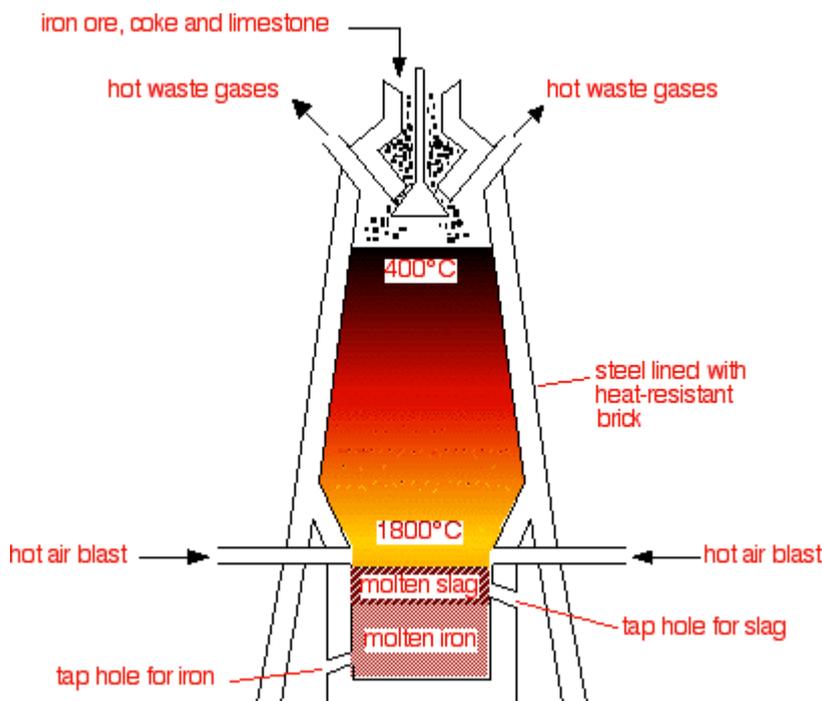


Chemguide – questions

EXTRACTION OF METALS: IRON

It is difficult to ask anything about this which doesn't insult your intelligence! If you are doing a course for 16 – 18 year old chemistry students, you have almost certainly come across it all in detail years ago. My apologies!

1. The diagram shows the Blast Furnace for the extraction of iron from its ore, taken as haematite.



Write the equation(s) for each of the following reactions:

- the formation of carbon monoxide in the furnace;
 - two reactions in which haematite is reduced to iron;
 - the function of the limestone in the furnace.
2. Most of the iron emerging from the furnace is converted into steel, which involves the removal of elements like sulphur, carbon, phosphorus and silicon. The basic oxygen process does this in two stages.
- Describe briefly how sulphur is removed in the first stage.
 - Describe briefly how the other elements are removed in the second stage, making clear what happens to the carbon, phosphorus and silicon present in the impure iron.

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3.
 - a) What is the major impurity in cast iron, and how does that affect the properties of cast iron?
 - b) Mild steel contains less than 0.25% carbon. What happens to the properties of the material as the percentage of carbon increases to about 1.5% in high-carbon steel?
 - c) How does mild steel differ from wrought iron?
 - d) What is iron alloyed with to make stainless steel?
 - e) Give a use for manganese steel.

I am not going to even attempt to ask questions about the environmental consequences of this process. If your examiners ask such questions, they are unlikely to be worth much more than a single mark. Check past papers to see what if anything your examiners ask, and learn just enough to satisfy them.