Extraction of iron using a blast furnace

Process

Carbon in coke burns in air to produce heat to maintain the temperature of the furnace $C(s)+O_2(g) \rightarrow CO_2(g)$ Forms carbon monoxide needed to reduce the iron oxide $CO_2(g) + C(s) \rightarrow 2CO(g)$ Reduction of iron ore haematite $Fe_2O_3(s) + 3CO(g) \rightarrow 2Fe(1) + 3CO_2(g)$ $Fe_2O_3(s) + 3C(s) \rightarrow 2Fe(1) + 3CO(g)$ Limestone is calcium carbonate. It decomposes to give calcium oxide, which combines with silicon dioxide to give calcium silicate $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$ $CaO(s) + SiO_2(s) ----> CaSiO_3(l)$

Raw materials

1. Haematite

- 2. Coke: Contains carbon that burns in air to produce heat, and reacts to form carbon monoxide needed to reduce iron oxide
- 3. Limestone: Contains calcium carbonate to help remove acidic impurities SiO₂ from the iron by reacting with them to form molten slag
- Air: Contains oxygen that allows the coke to burn, and produce heat and carbon monoxide 4.

What is meant by galvanized steel? Describe and explain the effect that galvanized steel has on the life of the car.

- Iron coated with zinc.
- It would take much longer before the car went rusty.
- and releases Zinc is more reactive than iron and so corrodes more easily. The corrosion of zinc forms zinc to electrons. These electrons flow to the iron and prevent its ionization (which would the rushing and prevent its ionization (which would the rushing and prevent its ionization (which would the rushing and rushing a state of the rushing and rushing a state of the rushing a sta

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What is structural isomerism

- m Notesa ne O The existence of molecules with the nt structural formulae cular for ula l
- Do isomers have same boiling
- No. Isomer mare the encondings, the toy be different boiling points

Characteristics of homologues in the same homologous series

- Same functional group
- Same general formula
- Gradation in physical properties

Advantages and disadvantages of fermentation

- Fermentation uses renewable resources and gentle conditions are used.
- Fermentation is a batch process

Name the black substance that appear on the bottom of the beaker when methane undergoes combustion and explain why the black substance formed

- Carbon
- Incomplete combustion occurs when the supply of air or oxygen is poor. Water is still produced, but carbon monoxide and carbon are produced instead of carbon dioxide.

Explain how the student could change the apparatus to avoid the black substances forming

- Maximize the surface area of the fuel and maximize the amount of oxygen present.
- Explain why the incomplete combustion of hydrocarbons causes safety problems
- Incomplete combustion leads to formation of carbon monoxide which is very poisonous.
- It combines with haemoglobin preventing transport of oxygen around the blood

Explain why an oil company might want to crack a hydrocarbon

- Crude oil produces too many larger hydrocarbons / not enough of the desirable smaller ones.
- Cracking introduces C=C double bonds which are more reactive and therefore more useful.

Why crude oil is not directly used as a fuel

- A lot of soot will be produced
- Does not burn completely