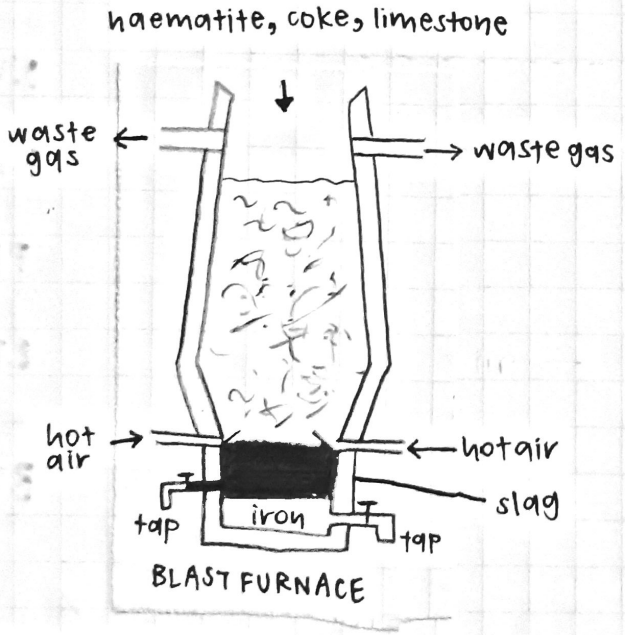
REACTIONS WITH DILUTE HYDROCHLORIC ACID

metal	observations
potassium	◦ reacts violently
sodium	◦ reacts violently
calcium	◦ reacts violently
magnesium	◦ reacts
aluminium	◦ reacts readily
zinc	◦ reacts moderately fast
iron	◦ reacts slowly
lead	◦ no reaction
copper	◦ no reaction
silver	◦ no reaction
gold	◦ no reaction

EXTRACTION OF IRON



IMPORTANT CHEMICALS

- haematite (Fe_2O_3)
- coke (mainly carbon)
- limestone ($CaCO_3$)

PROCESS

① coke oxidised by oxygen in hot air in an exothermic reaction

carbon + oxygen → carbon dioxide

$C(s) + O_2(g) \rightarrow CO_2(g)$

② carbon dioxide reacts with carbon to produce carbon monoxide

carbon dioxide + carbon → carbon monoxide

$CO_2(g) + C(g) \rightarrow 2CO(g)$

③ carbon monoxide reduces iron (III) oxide in haematite to molten iron

iron (III) oxide + carbon monoxide → molten iron + carbon dioxide

$Fe_2O_3(s) + 3CO(g) \rightarrow 2Fe(l) + 3CO_2(g)$

FORMATION OF SLAG

④ limestone undergoes thermal decomposition

calcium carbonate → calcium oxide + carbon dioxide

$CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$

⑤ silicon dioxide (sand) is removed by reacting with calcium oxide

calcium oxide + silicon dioxide → calcium silicate (slag)

$CaO(s) + SiO_2(s) \rightarrow CaSiO_3(l)$