

H₃₀⁺

Date _____
Page _____

→ Properties of HNO₃

• Physical:

→ Hygroscopic and fumes in air
∴ the bottle containing HNO₃ should always be stoppered.

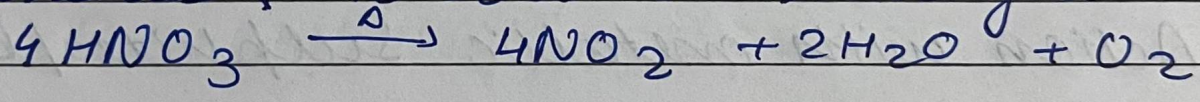
→ Aqueous solution of nitric acid (68% conc.) forms a constant boiling mixture at 121°C

→ Soluble in water

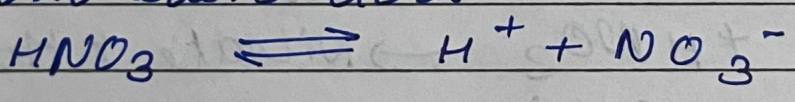
→ Non-poisonous

• Chemical:

→ Unstable to heat or sunlight.



→ Mono basic acid



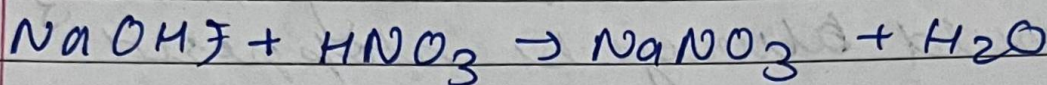
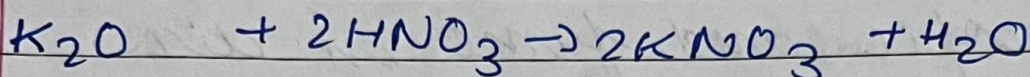
→ blue litmus → red

methy orange → Pink

Phenolphthalein → colourless

→ Reaction with alkalis:

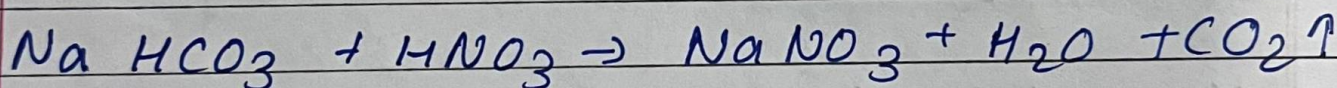
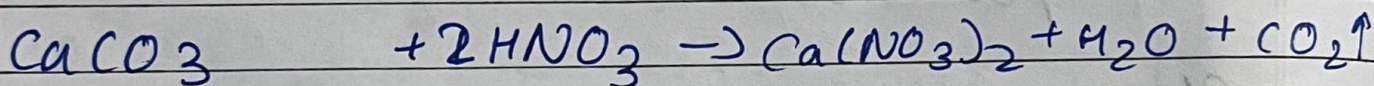
→ Base + Acid → Salt + water



→ neutralisation reaction

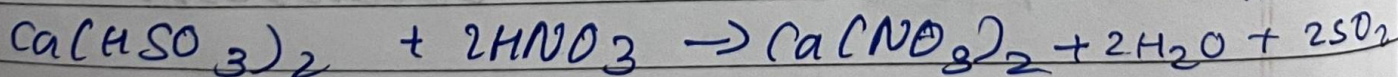
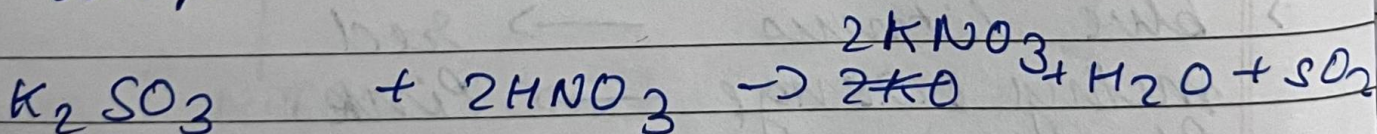
→ Reaction with carbonates / bicarbonate

→ Carbonate / Bicarbonate + Acid → salt + H₂O + CO₂

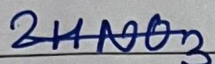


→ Action with metallic Sulphites / bisulphites

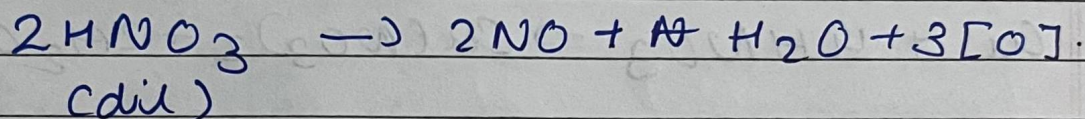
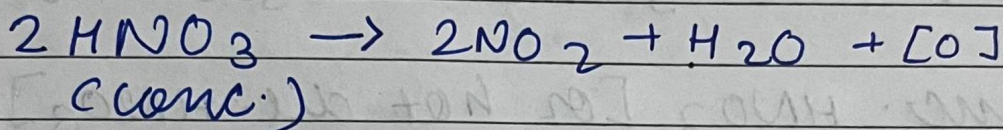
metallic sulphite / bisulphite + HNO₃ (dil) → metallic Nitrate + H₂O + SO₂



→ Oxidising property

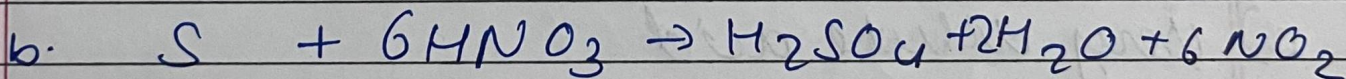
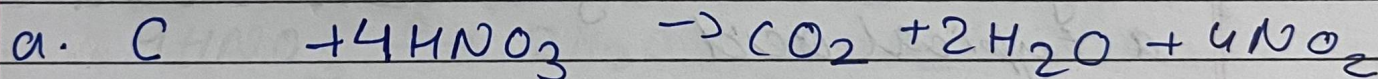


- Vigorously oxidises non-metals, metals inorganic compounds and organic substance



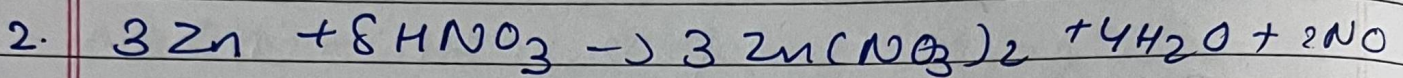
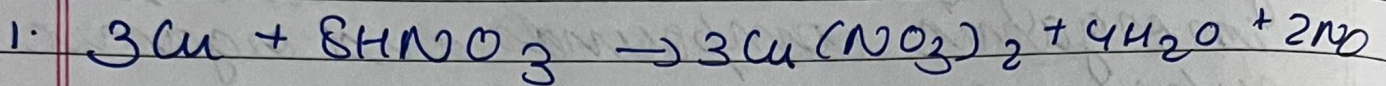
→ Action on non-metals

Non-metal + Acid → oxidised product + Water + NO_2

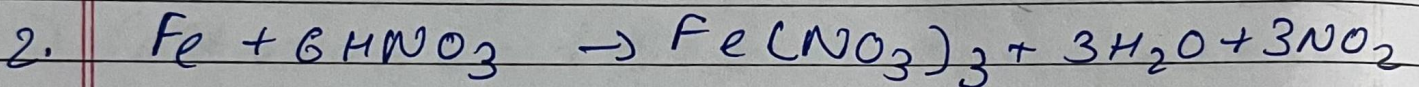
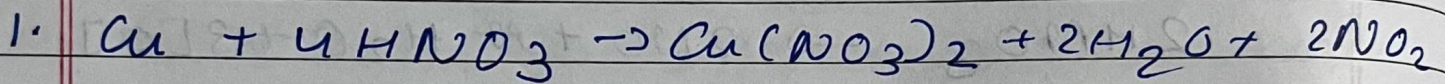


→ Action on metals

a) Cold and dil. HNO_3



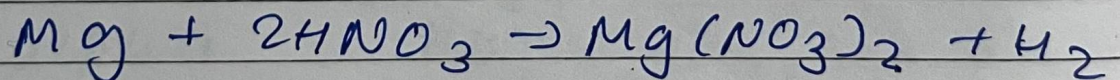
b) Conc. HNO_3 [or hot dil. HNO_3]



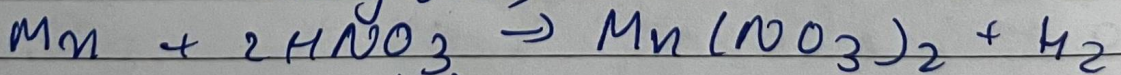
→ Metals like Fe, Al, Co and Ni become passive (inert) when treated with pure concentrated HNO_3

→ Why is Dil. HNO_3 is considered as a typical acid

c) Very dilute acid



(very dil.)

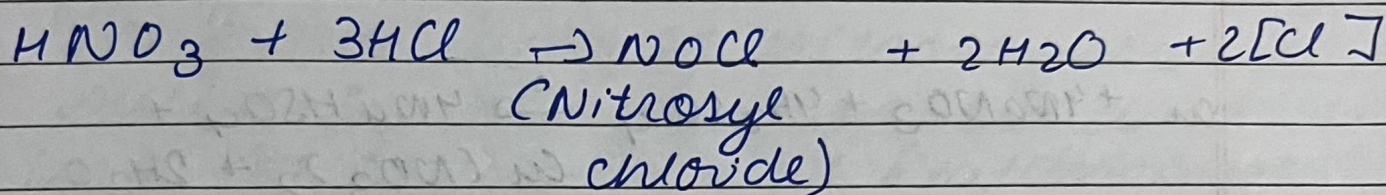


(very dil.)

→ Reaction as Aqua Regia:

(Royal water)

Aqua Regia - Conc. HNO_3 and Conc. HCl
in 1:3 ratio by volume

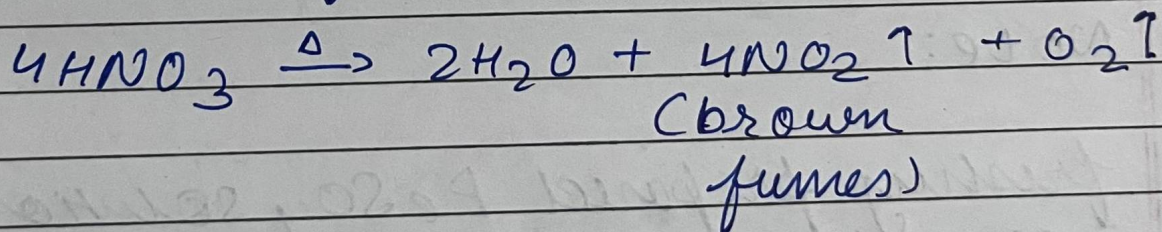


USES of HNO_3

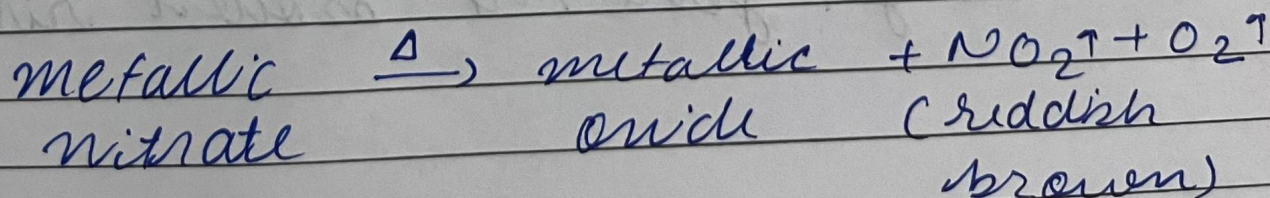
- i) To purify gold
- ii) To prepare fertilizers

TESTS FOR HNO_3 and Nitrates

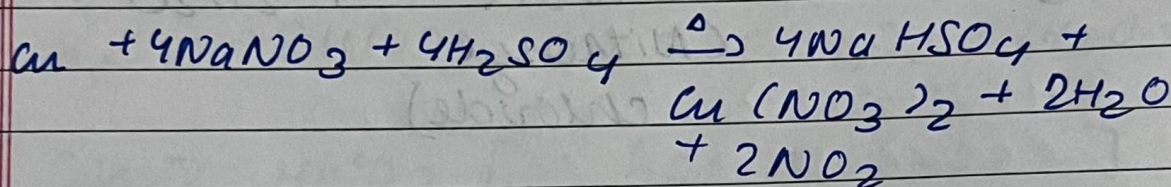
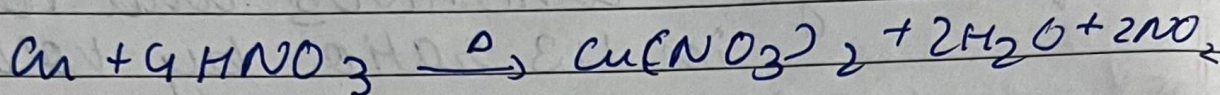
1. Conc. HNO_3 gives red brown fumes



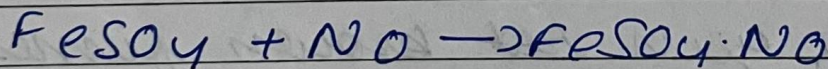
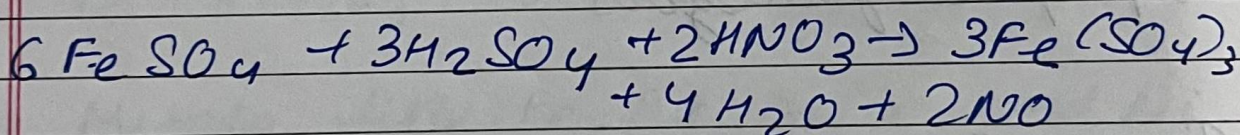
2. Nitrates



3. On adding Cu to HNO_3 or acidified nitrates



4. Brown Ring Test



Note:

1. freshly prepared FeSO_4 solution is used
 \therefore on exposure to air FeSO_4 gets oxidised to $\text{Fe}(\text{SO}_4)_3$ which will not get give the brown ring

2. The brown ring of nitrosoferrous sulphate is formed at the junction of two liquids
3. The brown ring of nitrosoferrous sulphate decomposes on distributing the test tube. The heat ~~is~~ ~~not~~ ~~not~~