

Displacement reactions and metal extraction

potassium	most reactive	K
sodium		Na
calcium		Ca
magnesium		Mg
aluminium		Al
carbon		C
zinc		Zn
iron		Fe
tin		Sn
lead		Pb
hydrogen		H
copper		Cu
silver		Ag
gold		Au
platinum	least reactive	Pt

Reactivity depends on tendency to form metal ion



A and C are Cations (Positive Ions)
B and D are Anions (Negative Ions)
Double Displacement Reaction

HT: OILRIG
Oxidation Is Loss of electrons
Reduction Is Gain of electrons

- Metal + Oxygen → Metal Oxide
- Metal + Water → Metal Hydroxide + hydrogen
- Metal + acid → Metal salt + Hydrogen

Reactions of acids

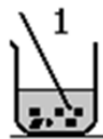
- Acid + metal → salt + hydrogen
- Acid + alkali → salt + water
- Acid + insoluble base → salt + water
- Acid + carbonate → salt + water + carbon dioxide

HT: OILRIG
e.g. $2HCl + Mg \rightarrow MgCl_2 + H_2$
Magnesium is oxidised
 $Mg \rightarrow Mg^{2+} + 2e^-$

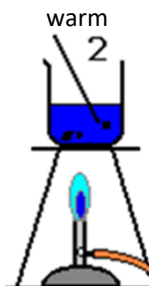
Hydrochloric Acid → Chlorides
 HCl
Nitric Acid → Nitrates
 HNO_3
Sulphuric Acid → Sulphates
 H_2SO_4

RP: Preparation of a dry sample of a soluble salt

Choose correct acid

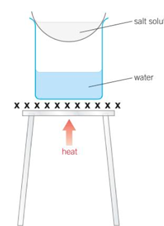


Add base to excess

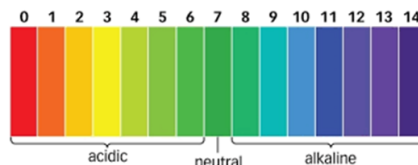


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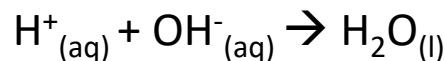
Evaporate off water



C5 Chemical Changes



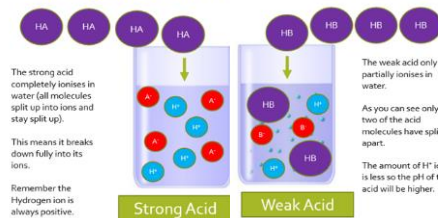
Acids produce H^+ ions
Alkalis produce OH^- ions



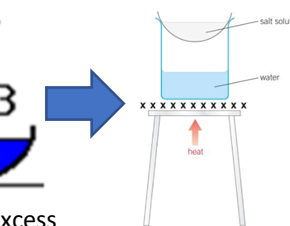
HT: Strong and Weak acids

Concentration of hydrogen ions in mol/dm ³	pH
0.10	1.0
0.010	2.0
0.0010	3.0
0.00010	4.0

Strong and weak acid:

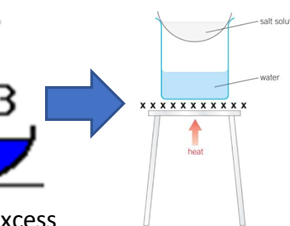


Evaporate off water



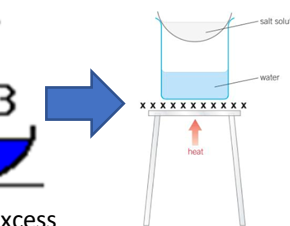
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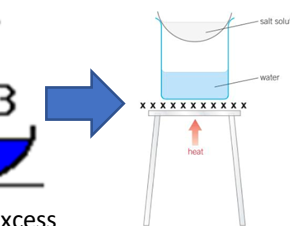
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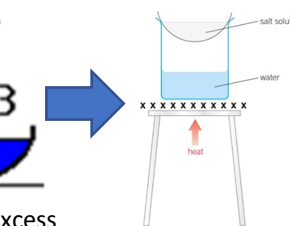
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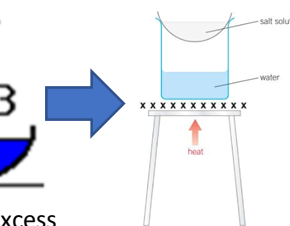
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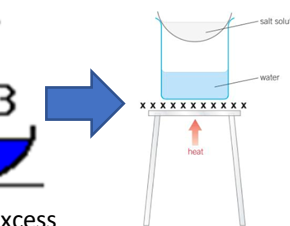
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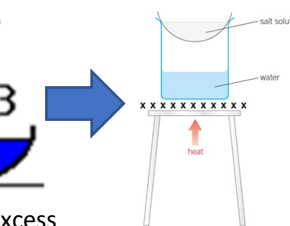
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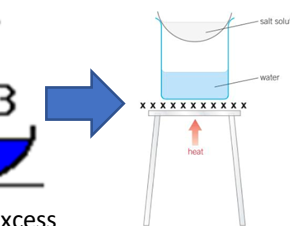
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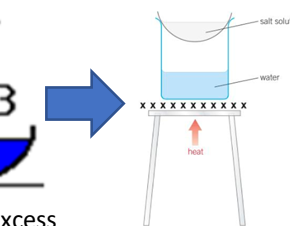
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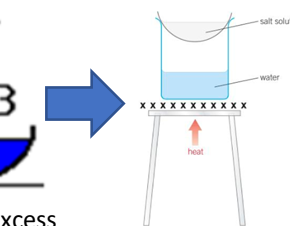
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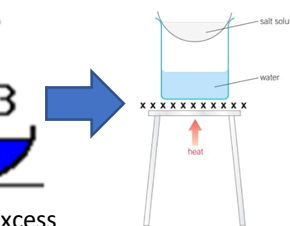
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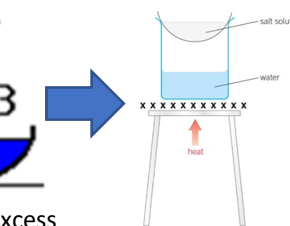
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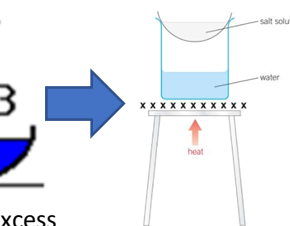
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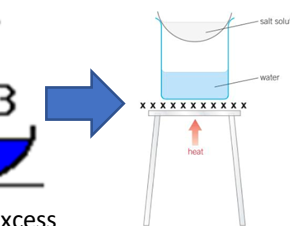
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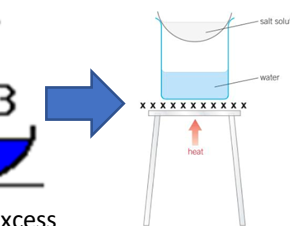
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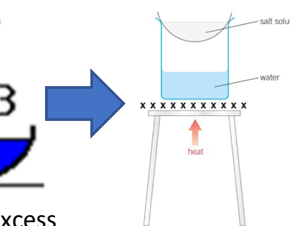
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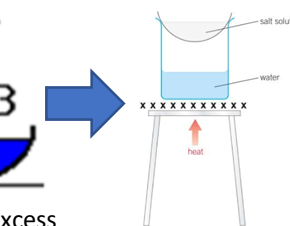
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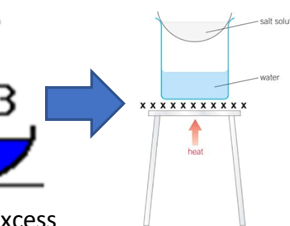
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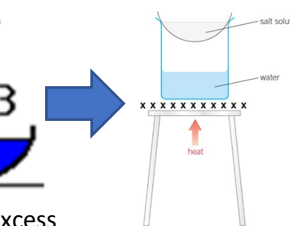
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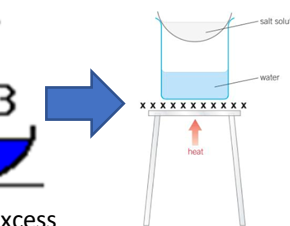
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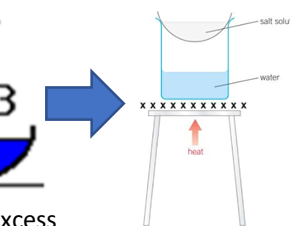
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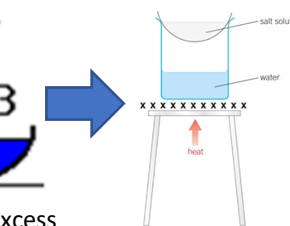
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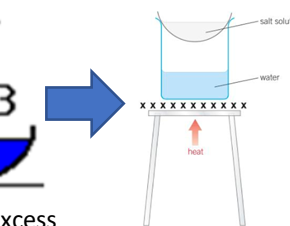
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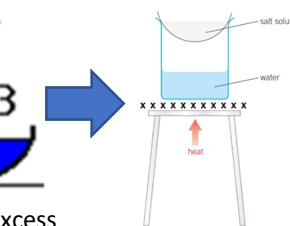
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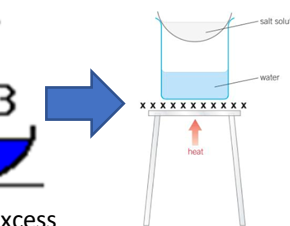
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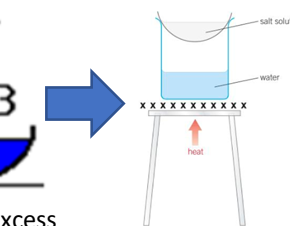
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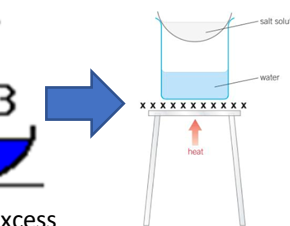
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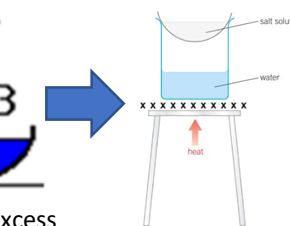
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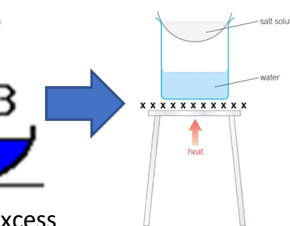
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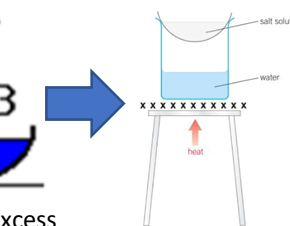
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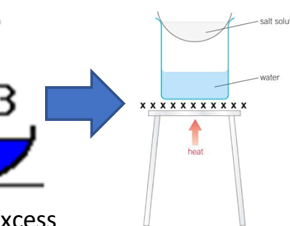
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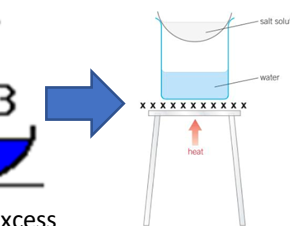
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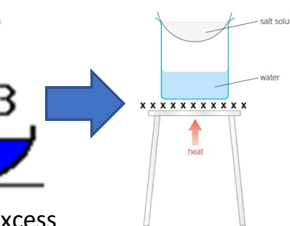
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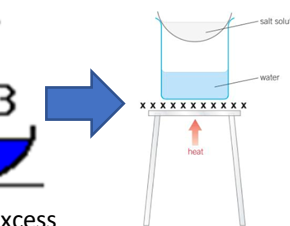
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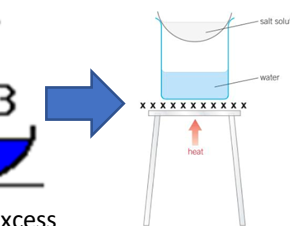
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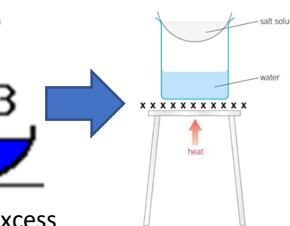
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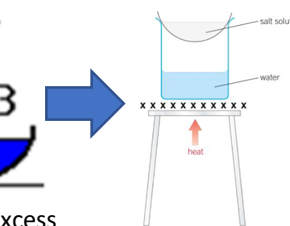
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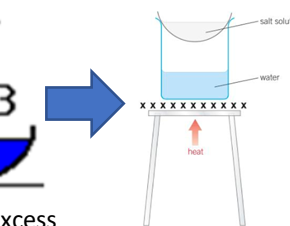
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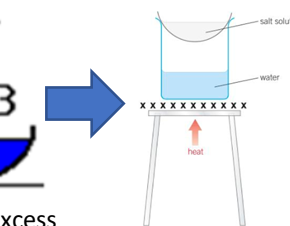
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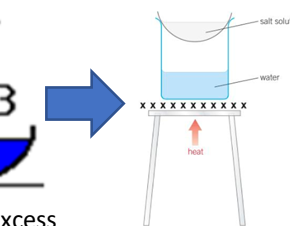
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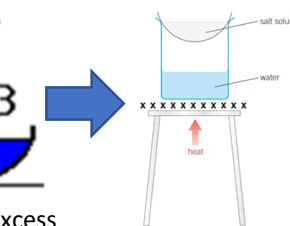
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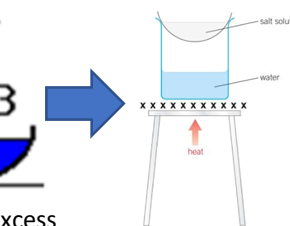
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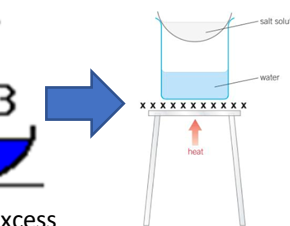
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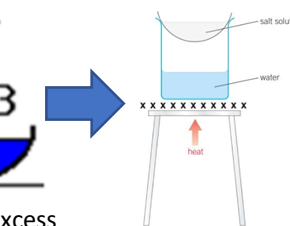
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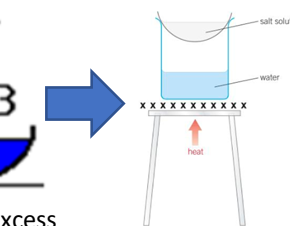
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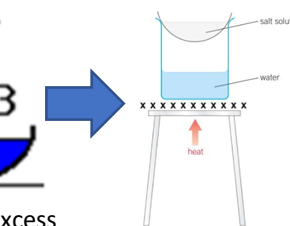
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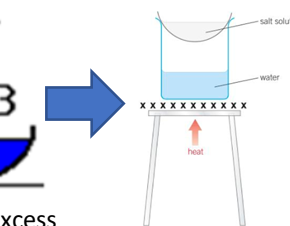
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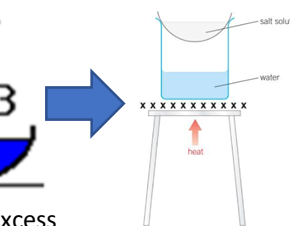
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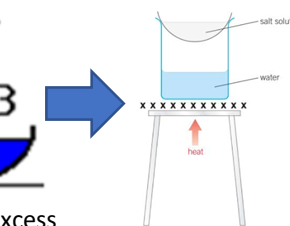
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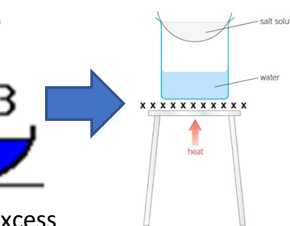
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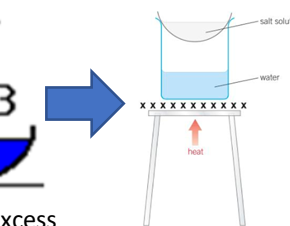
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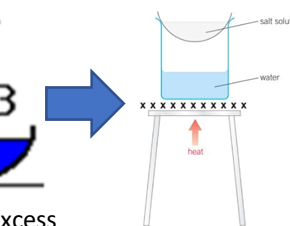
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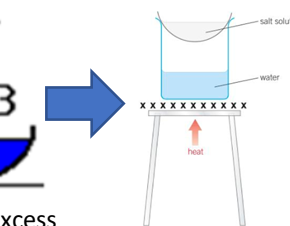
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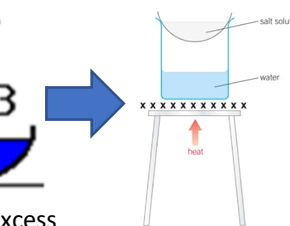
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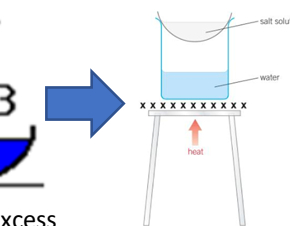
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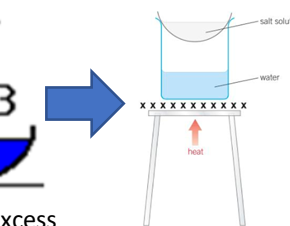
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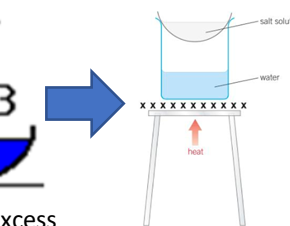
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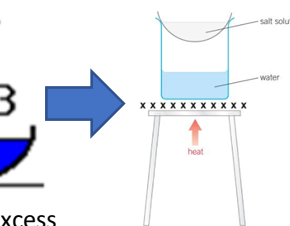
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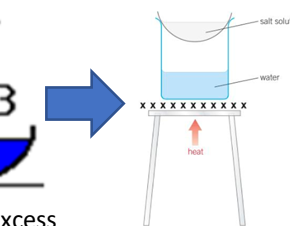
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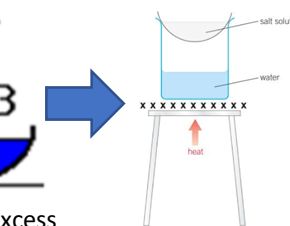
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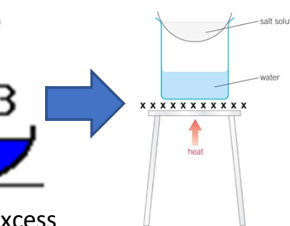
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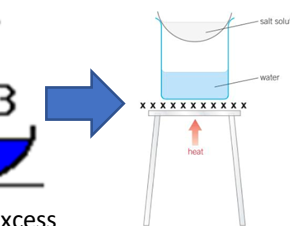
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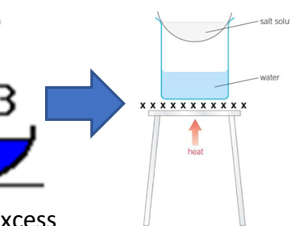
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