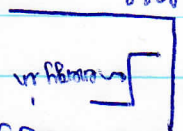


Removing Hardness

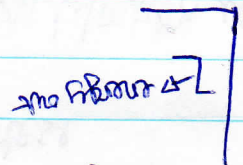
- Add Sodium carbonate solution (washing soda).
carbonate ions react with calcium + magnesium ions to form calcium/magnesium carbonate which then precipitate out of solution.
- Ion-exchange column
resin supplies hydrogen/sodium ions. Hard water passes through resin the calcium + magnesium ions are replaced by hydrogen/sodium ions.

Breaking and Making Bonds

more energy needed to break than make $\rightarrow$ ENDOTHERMIC



more energy needed to break than released when made $\rightarrow$ EXOTHERMIC.



Preview from Notesale.co.uk
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IDENTIFYING SUBSTANCES

Flame Test

Ba ²⁺	Barium - Green
Ca ²⁺	Calcium - Brick Red
K ⁺	Lithium - Red
	Potassium - Lilac
Na ⁺	Sodium - Yellow

Sodium Hydroxide Solution (NaOH)

Al ³⁺	Aluminium	white precipitate dissolves with more NaOH
Ca ²⁺	Calcium	white precipitate
Mg ²⁺	Magnesium	white precipitate
Cu ²⁺	Copper (II)	light blue precipitate
Fe ²⁺	Iron (II)	dirty green precipitate
Fe ³⁺	Iron (III)	reddish brown precipitate
NH ₄ ⁺	Ammonia	no precipitate red litmus $\rightarrow$ blue

Carbonates (CO₃²⁻)

add dilute acid (e.g. HCl), fizzes produces CO₂.
copper carbonate (green) $\rightarrow$ (black) copper oxide
zinc carbonate (white) $\rightarrow$ (yellow) hot zinc oxide (white) when cool.

+ heat