E Silver Nitrate

L)

K^+ lilac

Na^+ yellow

Ba^{2+} Apple green

* Homework

Q1: $Ca(OH)_2 + 2HNO_3 \rightarrow Ca(NO_3)_2 + 2H_2O$

D

Q2: $KClO_4$ $1+Cl-8=0$

$Cl=+7$

D

Q3: C

Q4: D

Q5: D

* Q6)

A

Q7: a)i) ClO^-

$Cl-2=-1$

$Cl=+1$ Cl^{+1}

ii)

$Cl = -2 : -1$
$Cl = +1$

b) $Cl_{2(g)} + H_2O_{(l)} \rightarrow HClO^{aq}_{(aq)} + HCl_{(aq)}$

$H^+ + ClO^- + H^+ + Cl^-$

0 (+1) (−1)

$Cl_{2(g)} + H_2O_{(l)} \rightarrow ClO^-_{(aq)} + Cl^-_{(aq)}$

oxidation

reduction

Cl_2 is both an oxidising agent and reducing agent.

c) $4KClO_{3(s)} \rightarrow 3KClO_{4(s)} + KCl_{(s)}$

$4 + x - 6 = 0$ $\quad 3 + x - 8 = 0$ $\quad Cl^{-1}$

$x = +2$ $\quad x = +5$

Cl^{+2} $\quad Cl^{+5}$

This reaction is a disproportionation reaction, Cl^{2+} oxidises to form Cl^{+5} and Cl^{2+} also reduces to produce Cl^{-1}.

Q5 a) i) oxidation is losing electrons while reduction is gaining electrons.

ii) Cl_2 is the oxidising agent, because it oxidises $2Br^-$ and itself is reduced.

b) $2Cl^-_{(aq)} + 2H_2O_{(l)} \rightarrow Cl_{2(aq)} + 2OH^-_{(aq)} + H_{2(g)}$

Q4

a) MgO, Mg_3N_2

b) i) $Ca_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)}$

ii) it increases down the group, because down the group, more shells and shielding, so weaker forces of attraction so ~~less energy needed~~ to remove ~~electrons~~ less ionization energy

iii) Increases

c) Down the group the size increases so less charge density so less polarizing power so causes less distortion so less able to decompose so more thermally stable

d) $LiNO_3 \xrightarrow{\Delta} Li_2O + NO_2 + O_2$

Q10 a) i) $NaCl + H_2SO_4 \rightarrow NaSO_4 + HCl_{(g)}$

$NaBr + H_2SO_4 \rightarrow NaSO_4 + HBr_{(g)} + Br_{2(g)}$

ii) ??

iii)

b) :) $HBr_{(g)} + H_2O_{(l)} \rightarrow HBrO + HBr$

::) turns from orange to red

c) Test for chloride and Iodide using $AgNO_3$ / HNO_3

Cl^- with $AgNO_3$ produces white ppt.
and I^- produces yellow ppt.

Q11 Did we take this?

Q12 a) i) it is an exothermic reaction

ii) $Ca(OH)_2$, pH

iii) $Ca(OH)_{2(aq)} + CO_{2(g)} \rightarrow CaCO_{3(s)} + H_2O_{(l)}$

b) i) $2Ca_{(s)} + O_{2(g)} \xrightarrow{\text{heat}} 2CaO_{(s)}$

$Ca(NO_3)_{2(s)} \xrightarrow{\Delta} CaO_{(s)} + NO_{2(g)} + O_{2(g)}$

ii) Down the group, have greater size so less charge density so less flp so causes less distortion so less able to decompose so more thermally stable