H.W

Lms!

1) D
2) D
3) C
4) D
5) D
6) B

7) a.i) +1

ii) chlorate ion

b. $Cl_{2(aq)} + H_2O_{(l)} \rightarrow ClO^-_{(aq)} + Cl_{(aq)} + 2H^+_{(l)}$

Cl_2 changes from 0 to +1 in ClO^- and -1 in Cl^-

disproportionation since chlorine has been oxidises and reduced.

c. oxidation # changes from +5 in $KClO_3$ → +7 in $KClO_4$ & -1 in KCl. So it has gone through disproportionation.

8) a) i) oxidation loses e^-, while reduction gains e^-.

ii) Chlorine, since it gained e^-'s, reducing agent.

b) $2H_2O + 2Cl^- \rightarrow Cl_2 + 2OH$

9) a) MgO and Mg_3N_2

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

~~Reactivity decreases~~

ii) down the group, it increases. Size increases, so more quantum shells, so less force of attraction, hence e^- are more readily given up so reactivity increases.

iii) ~~Solubility of~~ increases

c) Carbonates in group 2 are solids, so when heated, they will decompose forming metal oxide and CO_2. anions (ions) gains stability and binds to cation.

d) $4LiNO_3 \rightarrow 2Li_2O + 4NO_2 + O_2$

b) a) i) $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$

$3NaBr + 4H_2SO_4 \rightarrow 3NaHSO_4 + HBr + SO_2 + Br_2 + 2H_2O$.

ii) HCl is weaker than HBr, so it can't reduce H_2SO_4, SO HBr reduces $H_2S^{+6}O_4 \rightarrow S^{+4}O_2$. HBr oxidises from $-1 \rightarrow 0$ in Br_2.

iii) reacts with HCl forming white precipitate, ammonium chloride.

b) i) $HBr + H_2O \rightarrow H_3O^+ + Br^-$

ii) turns red because solution is acidic, since it has H^+.

c) Add HNO_3 and silver nitrate and ammonia (aq), filter → white ppt proving presence of Cl^- ions. add Conc. ammonia (aq), Solid won't dissolve proving presence of iodide ions.

11) a) i) shiny.

ii) black solid.

b) reactivity of halogens decreases down the group, as quantum shells increased, so less force of attraction.

c) $H_2 + At_2 \rightarrow 2HAt$

d) $Ra + Cl_2 \rightarrow RaCl_2$

e) D

12) a) i) exothermic reaction.

ii) Calcium hydroxide, 10, alkali/basic.

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

b) i) $2Ca + O_2 \rightarrow 2CaO$

ii) down the group = temp increases.

Cations becomes larger so charge density decreases → polarising power decreases, so nitrate ions polarise less.