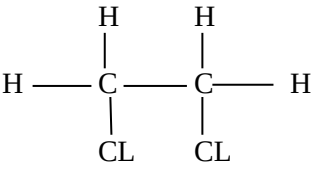
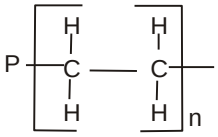
SCHOOL BASED FORM FOUR EXAMINATION JULY/AUGUST 2017
Chemistry Paper 2
Marking scheme

1.a)i Halogens
ii) Ionic radius increases from D to I this is due to increase in number of energy.
iii) Reactivity reduces from D to I due to increase in atomic radius down the group which leads to a decrease in the strength of nuclear force of attraction.
b) i) 2.8.7
ii) 2.8
c)i) F – S – Sulphur
ii) A molecule of sulphur is made of packed ring of 8 atoms joined by strong covalent bonds while a molecule of oxygen has weak van der wall forces hence higher B.P of sulphur than oxygen.
iii) $S_{(s)} + O_{2(g)} \rightarrow SO_{2(g)}$
iv Below 7 because SO_2 dissolves in water to form acidic solution of sulphurous acid.
2i) Heating
ii) M – sodium carbonate/ potassium carbonate
S – oxygen
T – nitric (v) acid
V – nitric (III) acid
iii) $[CU(NH_3)_4]^{2+}$
iv) I) $2CU(NO_3)_{2(s)} \rightarrow 2CUO_{(s)} + 4NO_{2(g)} + O_2$
II) $NO_{2(g)} + H_2O(l) \rightarrow HNO_{2(aq)} + HNO_{3(aq)}$
3.a) i) Water
ii) Any pH between 4 - 7 – due to presence of carbonic acid
iii) $2Na_2O_{2(aq)} + 2H_2O_{(l)} \rightarrow 2NaOH_{(aq)} + O_{2(g)}$
b) Brown solution change to pale green solution. This is due to F^{3+} reduced to Fe^{2+} by H_2S
c.i) When CO_2 is bubbled in lime water white precipitate is formed while NO_2 white precipitate formed with CO.
ii) Extraction of metals, used as fuel
d) CO_2 is highly soluble in sodium hydroxide to form Na_2CO_3 while is slightly soluble in water.
4a)i) Ethanoic acid
ii) Gas V – carbon (IV) oxide
b) i) hydrogenation
ii) halogenation
c.i) oxidation
ii)

Q.



I, 2 – dichloroethane



Poly – ethene
d) $CH_2CH_2 + CL_2 \rightarrow CH_2CLCH_2CL$
5.a)
i) limestone
ii) hot air
iii) ore/ iron oxide
iv) coke/C (2mks)
b) $C_{(s)} + CO_{2(g)} \rightarrow 2CO_{(g)}$ (1mk)
c) The reaction between coke/coal and the hot air is highly exothermic. (1mk)
d)i) Slag is immiscible with molten iron/insoluble
ii) Slag is less denser than molten iron. (2mks)
e)i) By passing/ blowing oxygen into molten iron which converts carbon into carbon (IV) oxide.
ii) To increase the tensile strength/ making iron less brittle, more malleable, more ductile. (2mks)
f) It contains impurities eg carbon and manganese which lowers the melting point. (2mks)

g) Construction of bridges/ ship/ buildings/car bodies, nails railway lines, pipes, spoons, pressure cookers, horse shoe magnet.√½ (2mks)

6.a) i) Wrong method of collection.√½ (3mks)
- ammonia is less denser than air.√½

(ii) - Flask should be slanting downwards left to right .√½
- Water produced may run back & break the flask .√½
- Moist reactants should not be used .√½
- ammonia gas dissolves in water .√½

ii) Anhydrous calcium oxide

iii) $2NH_4Cl_{(s)} + Ca(OH)_{2(s)} \rightarrow 2NH_{3(g)} + 2H_2O_{(l)} + CaCl_{2(s)}$

(iv) Deep a glass rod in conc. HCl and bring it into contact with ammonia in a test tube. White fumes formed.

b.i) Unit 1

ii) X – nitrogen (II) oxide (NO)
Y – nitrogen (IV) oxide (NO_2)

iii) NH_3
$x + (+1 \times 3) = 0$
$x = -3$ √1

HNO_3
$+1 + x + (-2 \times 3) = 0$
$+1+(-6) + x = 0$
$-5 + x = 0$
$x = +5$ √1

Nitrogen in NH_3 has an oxidation state of -3 while in HNO_3 has oxidation state of +5. Increase in oxidation state is oxidation. √1

iv) NH_4NO_3
N = 28
H = 4
O = 48
80

$\frac{28}{80} \times 100 = 35.0\%$

7a) I – 0.8M
III – 0.1M

b)i) State of balance where forward reaction takes place at the same rate as reverse reaction.

ii) Yellow colour intensifies
Addition of KOH favours forward reaction since conc. Of OH^- increases .: reaction proceeds in the forward direction to react the increased OH^-

c) i) in the table

$^1/_t$	0.114	0.1	0.085	0.085	0.074	0.057	0.055	0.029	0.014

2 mks

ii) Graph
Scale - 1
Plotting – all 2
≥ 5 1
≤ 5 0
Curve 1

iii) $^1/_{15} = 0.67 sec^{-1}$ value from the graph. √½