June 2004

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0620/02

CHEMISTRY
1 (a) B, C, F (all needed); Only contain one type of atom
NOT: contain one kind of molecule
NOT: cannot be split using chemical means [1]

(b) C [1]

(c) (i) B [1]

(ii) any gas with diatomic molecules e.g. chlorine, hydrogen, hydrogen chloride [1]

(d) (i) F [1]

(ii) pencil 'leads'/in pencils/lubricant/in electrical conductors/for electrodes/
in tennis racquets/in golf clubs/hockey sticks etc [1]

(e) (i) substance containing 2 or more different atoms
combined/bonded/joined (both parts needed for mark) [1]
ALLOW: elements (chemically) combined

(ii) methane [1]

(f) (i) 8 electrons round chlorine and bonded pair with dot and cross = 2 [2]
ALLOW: all dots or all crosses
Correct number of electrons but bonded pair not clearly on overlap = 1
NOT: molecules other than hydrogen chloride

(ii) covalent [1]

(iii) blue litmus;
(litmus) turns red [1]

(iv) pH2 [1]

(v) 2 [1]

(vi) magnesium chloride
NOT: formula [1]

Total = 17

2 (a) insoluble particles/solids/dirt trapped/cought on stones;
NOT: filter reacts with insoluble impurities
NOT: impurities unqualified
Water passes through/filtered OWTTE [1]

(b) (i) kill bacteria/germs, disinfect water OWTTE [1]

(ii) neutralises acidity/water
ALLOW: reacts with acids in water [1]

(iii) calcium hydroxide
NOT: formula [1]

(iv) neutralising acid soils/neutralising acidic (industrial) waste/making
bleaching powder/removing acidic gases/in Solvay process/in recovery of
ammonia/making limewater/in water softening/for making plaster/for
making mortar/controlling soil acidity
NOT: neutralising acids unqualified
NOT: making cement [1]
(c) (i) 100; °C (conditional on 100) [1]

(ii) anhydrous cobalt chloride/anhydrous copper sulphate (or correct colours); [1]
NOT: cobalt chloride/copper sulphate unqualified
Turns pink/blue (respectively) [1]

(iii) any suitable e.g. washing/cleaning/drinking/cooking [1]

(d) B [1]

(e) ethanol [1]
NOT: alcohol

(f) potassium hydroxide; hydrogen [1]
NOT: symbols

Total = 15

3 (a) means of measuring gas volume e.g. gas syringe/measuring cylinder (must be graduated); [1]
flask/test tube/vessel with calcium carbonate + acid leading to syringe etc [1]
IGNORE: lack of reference to closed system (unless drawing incorrect) [1]
record volume on gas syringe/measuring cylinder/measure how much carbon dioxide given off [1]
at various time intervals/at a particular time [1]
OR
flask/vessel with calcium carbonate and hydrochloric acid in flask (1) [1]
measure its mass at beginning of experiment (1)
measure mass of flask and contents during reaction (1) [1]
at specific time(s) (1)

(b) (i) faster/greater/speeds up [1]

(ii) slower/less [1]

(iii) faster/greater/speeds up [1]

(c) (i) add aqueous sodium hydroxide; [1]
white precipitate; [1]
insoluble in excess (incorrect reagent = 0) [1]
ALLOW: flame test - brick red

(d) (i) high in the reactivity series/very reactive [1]

(ii) 2 electrons in outer shell; [1]
inner shells correct as 2,8,8 [1]

Total = 13
4 (a) ethanol - solvent
ethene - polymer
bitumen - roads [3]

(b) ethanol [1]

(c) (i) C [1]
(ii) A [1]
(iii) B [1]
(iv) D [1]

(d) (i) (compound) containing only carbon and hydrogen
NOT: it contains carbon and hydrogen [1]

(ii) has only single bonds/ has general formula C_nH_{2n+2}
NOT: it is saturated [1]

Total = 10

5 (a) chlorine, argon, potassium, bromine, iodine
ALLOW: symbols [1]

(b) chlorine, potassium, argon, bromine, iodine
ALLOW: symbols [1]

(c) 2nd box down ticked [1]

(d) chlorine, bromine, iodine (all 3 needed)
ALLOW: symbols [1]

(e) (i) potassium/K [1]

(ii) argon/Ar [1]

(f) 1st and 4th boxes ticked (1 mark each) [2]

(g) (i) high (boiling point) [1]

(ii) conducts/is high [1]

(h) potassium loses an/one electron/loses outer shell
chlorine gains an/one electron/outer shell becomes complete
ALLOW: (for 1 mark) potassium loses two electrons + chlorine gains two electrons
ALLOW: e.g. 2.8.8.1 → 2.8.8 for first mark
Any indication of sharing electrons = 0 [1]

Total = 12
6 (a) carbon monoxide [1]

(b) iron oxide loses oxygen/it loses oxygen/oxidation number of iron decreases [1]
ALLOW: iron gains electrons
Answer must refer to the iron/iron oxide - therefore:
NOT: carbon monoxide gains oxygen
NOT: oxygen lost in the reaction
NOT: iron loses oxygen

(c) 3; 2 (one mark each) [2]

(d) (i) oxidise the impurities/oxidise Si or P or C/burn off the impurities [1]
NOT: get rid of impurities
NOT: slag formation

(ii) exothermic [1]

(iii) is/floats above the molten iron [1]

(iv) calcium oxide [1]

(v) stronger/harder/not brittle/less easily corroded ORA e.g. iron rusts [1]
NOT: less corrosive

(e) any 3 of:
high melting/boiling points;
have coloured compounds (NOT: they are coloured);
have high densities;
form complex ions;
elements/compounds are good catalysts;
form ions with different charges/variable oxidation states [3]

(f) alloys [1]

Total = 13

Grand Total = 80