Acids, bases and salts

Mark scheme

1. sodium nitrate — 1
N_aNO_3 — 1

*do not credit lower case N **or** O, upper case A*

potassium sulphate — 1
K_2SO_4 — 1

*accept potassium hydrogen sulphate **or** $KHSO_4$*
do not credit lower case K, S or O
ignore charges on ions

[4]

2. (a) (i) lead chloride/product of lead + chloride ions is insoluble (in water) — 1

for 1 mark

(ii) $Pb^{2+} + 2C1^{-} \rightarrow PbC1_2$ *(s) — 3

(allow $(Pb)^{2+}$ 2 $(C1^{-})$)

formula
solid state symbol
balancing
for 1 mark each

(b) copper hydroxide $Cu(OH)_2$ — 5

each for 1 mark

lead sulphate $PbSO_4$

each for 1 mark

no precipitate

for 1 mark

Allow 1 mark for correct formula Na_2SO_4 in (i)

Allow 1 mark for correct formula $Mg(NO_3)_2$ in (ii)

0 marks for any formula in (iii)

[9]

3. (a) sodium — 1

(b) neutralisation — 1

(c) increase/inc. number — 1

(d) H^+ — 1

(e) OH^- — 1

(f) $H^+ + OH^- \rightarrow H_2O$ — 1

[6]

4. (i) Mg + (H_2SO_4) → 1

MgSO4 + 1

H_2 1

*deduct **1** mark if not balanced only if all three correct*
*accept alternative metal of similar reactivity for example Zn **or** Fe*
candidate would not then be awarded first mark for Mg
then error carried forward

*deduct **1** mark if not balanced only if all three correct*

(ii) to remove the (excess) magnesium 1

accept separate

*accept insoluble substances **or***
*solids **or** residue*

*do **not** accept unreactive substances*
***or** impurities **or** remove magnesium from sulphuric acid*

(iii) to <u>evaporate</u> (some of the water **or** solution) 1

to form crystals **or** crystallise 1

accept to form a saturated solution
***or** concentrated solution*

*do **not** accept to leave $MgSO_4$*

[6]

5. hydrogen ions (from acid) or protons / H^+ 1

react with hydroxide ions (from alkali) / OH^- 1

to produce water 1

*$H^+ + OH^- \longrightarrow H_2O$ gains all **3** marks*
ignore state symbols
molecules of hydrogen <u>ions</u> and molecules of hydroxide <u>ions</u>
*produce water = **2** marks*
*if they fail to get any of the above marks they can get **1** mark for*
neutralisation / product neutral

[3]

6. (a) (2) : (6) : (2) 2

All 3 correct gains 2 marks
2 correct gains 1 mark

(b) no water present/moist air cannot enter/do not thoroughly mix/ must be in solution etc. 1

for 1 mark

(c) (i) hydroxide (ion) / OH^- 1

for 1 mark

(ii) hydrogen (ion) / H^+ 1

for 1 mark

(iii) water/H_2O/hydrogen oxide 1

for 1 mark

[6]