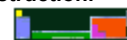


Revised August 2012



HONORS WORKSHEET 5c: Aqueous Solution Summary



In all questions, balance any equations you write

1. Electrolytes & non-electrolytes

Indicate if you would expect the following compounds to be electrolytes or non-electrolytes when in aqueous solution. In each case **very briefly** explain your answer. **Use equations if appropriate.** (6)

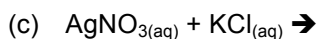
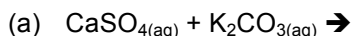
(a) Lithium bromide

(b) Methanol (CH₃OH, an alcohol similar to ethanol – **NOT a hydroxide**)

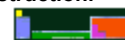
(c) Ethanoic acid (a weak acid)

2. Precipitation reactions and net ionic equations

Predict if a precipitation reaction will occur in each of the following cases. If it does, write the full, balanced equation **AND** the net ionic equation (including state symbols) to show the formation of the precipitate. If there is no reaction, say so, and indicate why. (9)



Revised August 2012



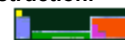
3. Acids and bases & neutralization

- (a) Write a full, balanced equation for the reaction of aqueous nitric acid and aqueous lithium hydroxide to produce an aqueous salt and water. (2)
- (b) Re-write the equation in (a) showing all ions present with state symbols. (2)
- (c) Re-write the equation in (b), removing any spectator ions (i.e. write the net ionic equation) with state symbols. (2)

4. Oxidation number concept

What is the oxidation number of each of the underlined atoms in each of the following species? Think carefully about the rules that are being applied and write a **very brief, simple explanation** of your answer in each case. (8)

- (a) KI
- (b) GeO
- (c) NaO₂
- (d) NH₄⁺



5. REDOX and half equations

For each of the following ionic solids, write a balanced overall equation to show their formation from their elements. Then write the two balanced half equations (one showing oxidation, one showing reduction) that show the formation of the individual ions involved. (9)

(a) Sodium oxide

OVERALL:

OXIDATION:

REDUCTION:

(b) Potassium chloride

OVERALL:

OXIDATION:

REDUCTION:

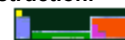
(c) Aluminum sulfide

OVERALL:

OXIDATION:

REDUCTION:

Revised August 2012



6. Disproportionation

(a) Consider the following reaction.



Write two balanced half equations (one oxidation, one reduction) to show the changes that the chlorine atoms undergo. (4)

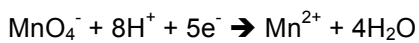
OXIDATION:

REDUCTION:

(b) Is this reaction a disproportionation? Justify your answer. (2)

7. REDOX

(a) Consider the following half equations.



Combine these two half-equations to obtain the overall reaction of iron(II) ions with manganate(VII) ions. (2)

(b) Identify the oxidizing agent in (a), and the species that is oxidized. (2)

OXIDIZING AGENT:

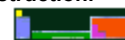
OXIDIZED SPECIES:

(c) Identify the reducing agent in (a), and the species that is reduced. (2)

REDUCING AGENT:

REDUCED SPECIES:

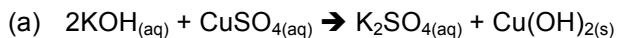
Revised August 2012



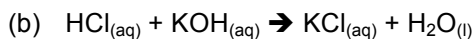
8. Classification of chemical reactions

By choosing **two** of the following reaction types from the list below, classify each of the following reactions in **two ways**. (12)

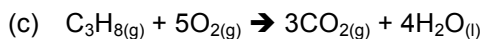
Reaction types: precipitation, acid-base, REDOX (oxidation and reduction), single displacement, double displacement, combination, decomposition, combustion.



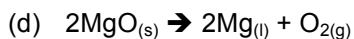
AND



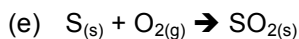
AND



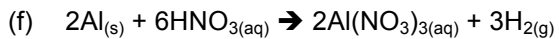
AND



AND



AND



AND