

CHEMISTRY

MODULE 5 EQUILIBRIUM

HOMEWORK 6

1. Solution Equilibria
2. K_{sp} Calculations



YEAR 12

Name:
Teacher:

1. Tommy wanted to investigate the solubility of calcium hydroxide at 20°C so he performed the following steps:

- The thermostat of the classroom was set at 20°C.
- A 1L beaker was filled with 1000 mL of distilled water.
- 5.00 g of calcium hydroxide was added to the beaker and mixed thoroughly with a stirring rod.
- Filtration was then performed using the mixture and the results found below.

Mass of filter paper	0.833 g
Mass of filter paper + residue	2.403 g

a) Why is evaporation not a suitable technique for separating out the precipitate? 1

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b) Calculate the solubility of calcium hydroxide at 20°C (in g/100mL). 2

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2. Using your data sheet, calculate the molar solubility of the following salts in

- i) water
- ii) 0.75M Na₃PO₄ solution.

A. Silver phosphate

i) 2

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ii) 3

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B. Magnesium phosphate

i)

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ii)

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3. 25.0 mL of 0.0010 M potassium chromate (K_2CrO_4) is mixed with 75.0 mL of 0.000625 M lead(II) nitrate ($Pb(NO_3)_2$).

a) Given that the K_{sp} of lead(II) chromate is 1.8×10^{-14} , will a precipitate of lead(II) chromate form?

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b) Find the concentration of Pb^{2+} in the final solution.

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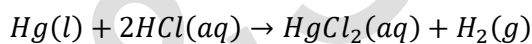
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4. Mercury reacts with hydrochloric acid (HCl) to form mercury(II) chloride (HgCl_2) by the following reaction:



3.08 g of mercury was added to a 0.500 L 0.300 M HCl solution at 10 °C and left to react until no more metal could be seen. 8.30 g of mercury(II) chloride was then added to the mixture and stirred.

Given that the solubility of mercury chloride in water at 10 °C is 4.82 g/ 100 ml, by finding the ionic product, determine whether a precipitate will form:

A. Before the mercury (II) chloride was added.

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B. After the mercury (II) chloride was added.

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NGO & SONS