NAME:.....

S.6 CHEMISTRY TOPICAL TESTS
SOLUBILITY EQUILIBRIA
TIME ALLOWED: 1 HOUR 10 MINUTES

Instructions: Attempt ALL questions.

1 a) Define
i. Common ion effect
ii. Solubility product
iii. Solubility of a salt

b.) Describe an experiment that can be carried out to determine the solubility product of silver chromate in the laboratory.

c.) The solubility of silver chromate at 25^0C is 3.21×10^{-2}gdm^{-3}. Calculate the;
i. Solubility product at this temperature
ii. Solubility of silver chromate in 0.2M potassium chromate solution.
iii. Solubility of silver chromate in 0.05M silver nitrate solution.

d.) Explain the effect of adding the following solutions on the solubility of silver chromate.
i. Ammonia solution
ii. Silver nitrate solution

e.) A solution of silver nitrate was added to a solution of containing 0.05M potassium chromate and 0.05M potassium chloride. Calculate the concentration of silver ions required to precipitate :
i. Silver chloride
ii. Silver chromate

f.) State which of the compounds in (e) will precipitate first. Give a reason for your answer.(Solubility product of silver chloride = 1.0×10^{-10} mol^{2}dm^{-6} at 25^0C)

2. Lead (II) chloride is sparingly soluble in cold water.

(a)(i) Write the equation for the solubility of lead (II) chloride in water.

(ii) Write the expression for the solubility product, K_{sp} for lead (II) chloride in water.

b.) At 25^0C, a saturated solution contains 1.1g of lead (II) chloride per litre. Calculate the solubility product at this temperature.

c.) Solid lead (II) chloride can be prepared in the laboratory by heating lead (II) oxide with dilute hydrochloric acid and the mixture cooled. However, solid lead (II) chloride cannot be formed when lead (II) oxide is reacted with concentrated hydrochloric acid. Give reasons for this observation and illustrate your answer with an equation.

d.) State any two conditions under which solubility product is valid

e.) Outline any three methods which can be used to determine the solubility product of differen sparingly soluble salts.

f.) State any four applications of solubility product

END