

NEET EQUILIBRIUM — SOLUBILITY PRODUCT (K_{sp}) AND PRECIPITATION — PYQS

Max. Marks: 84

Questions: 21

Section A (MCQ) — 21 questions

- Q.1** In a qualitative analysis, Bi^{3+} is detected by appearance of precipitate of $\text{BiO}(\text{OH})(\text{s})$. Calculate pH when the following equilibrium exists at 298 K : $\text{BiO}(\text{OH})(\text{s}) \rightleftharpoons \text{BiO}^+(\text{aq}) + \text{OH}^-(\text{aq})$, $K = 4 \times 10^{-10}$

(Given : $\log 2 = 0.3010$) [NEET (UG) 2026]

- (1) 4.699 (2) 5.286 (3) 8.714 (4) 9.301

Scan or tap for the full solution



- Q.2** The correct order of solubility of the given salts in water at 298 K is

Salt	K _{sp} at 298 K
AgBr	5.0×10^{-13}
$\text{Zn}(\text{OH})_2$	1.0×10^{-15}
Hg_2Cl_2	1.3×10^{-18}

[RE-NEET (UG) 2026]

- (1) $\text{Zn}(\text{OH})_2 > \text{AgBr} > \text{Hg}_2\text{Cl}_2$
 (2) $\text{Hg}_2\text{Cl}_2 > \text{Zn}(\text{OH})_2 > \text{AgBr}$
 (3) $\text{AgBr} > \text{Zn}(\text{OH})_2 > \text{Hg}_2\text{Cl}_2$
 (4) $\text{Hg}_2\text{Cl}_2 > \text{AgBr} > \text{Zn}(\text{OH})_2$

Scan or tap for the full solution



- Q.3** The ratio of solubility of AgCl in 0.1 M KCl solution to the solubility of AgCl in water is: (Given : Solubility product of AgCl = 10^{-10})

[RE-NEET (UG) 2024]

- (1)
- 10^{-4}
- (2)
- 10^{-6}
- (3)
- 10^{-9}
- (4)
- 10^{-5}

Scan or tap for the full solution



- Q.4** Find out the solubility of $\text{Ni}(\text{OH})_2$ in 0.1 M NaOH. Given that the ionic product of $\text{Ni}(\text{OH})_2$ is 2×10^{-15} .

[NEET (UG) 2020]

- (1) 2×10^{-8} M (2) 1×10^{-13} M
 (3) 1×10^8 M (4) 2×10^{-13} M

Scan or tap for the full solution



- Q.5** pH of a saturated solution of $\text{Ca}(\text{OH})_2$ is 9. The solubility product (K_{sp}) of $\text{Ca}(\text{OH})_2$ is :

[NEET (UG) 2019]

- (1) 0.125×10^{-15} (2) 0.5×10^{-10}
 (3) 0.5×10^{-15} (4) 0.25×10^{-10}

Scan or tap for the full solution



- Q.6** The solubility of BaSO_4 in water is 2.42×10^{-3} g L^{-1} at 298 K. The value of its solubility product (K_{sp}) will be (Given molar mass of $\text{BaSO}_4 = 233$ g mol^{-1})

[NEET 2018]

- (1) 1.08×10^{-10} $\text{mol}^2 \text{L}^{-2}$ (2) 1.08×10^{-12} $\text{mol}^2 \text{L}^{-2}$
 (3) 1.08×10^{-14} $\text{mol}^2 \text{L}^{-2}$ (4) 1.08×10^{-8} $\text{mol}^2 \text{L}^{-2}$

Scan or tap for the full solution



- Q.7** Concentration of the Ag^+ ions in a saturated solution of $\text{Ag}_2\text{C}_2\text{O}_4$ is 2.2×10^{-4} mol L^{-1} . Solubility product of $\text{Ag}_2\text{C}_2\text{O}_4$ is

[NEET 2017]

- (1) 2.66×10^{-12} (2) 4.5×10^{-11}
 (3) 5.3×10^{-12} (4) 2.42×10^{-8}

Scan or tap for the full solution



- Q.8** MY and NY_3 , two nearly insoluble salts, have the same K_{sp} values of 6.2×10^{-13} at room temperature. Which statement would be true in regard to MY and NY_3 ?

[NEET 2016 (Phase 1)]

- (1) The salts MY and NY_3 are more soluble in 0.5 M KY than in pure water.
 (2) The addition of the salt of KY to solution of MY and NY_3 will have no effect on their solubilities.
 (3) The molar solubilities of MY and NY_3 in water are identical.
 (4) The molar solubility of MY in water is less than that of NY_3 .

Scan or tap for the full solution



- Q.9** Identify the correct order of solubility in aqueous medium.

[NEET 2013]

- (1) $\text{Na}_2\text{S} > \text{CuS} > \text{ZnS}$ (2) $\text{Na}_2\text{S} > \text{ZnS} > \text{CuS}$
 (3) $\text{CuS} > \text{ZnS} > \text{Na}_2\text{S}$ (4) $\text{ZnS} > \text{Na}_2\text{S} > \text{CuS}$

Scan or tap for the full solution



Q.10 The solubility of AgCl(s) with solubility product 1.6×10^{-10} in 0.1 M NaCl solution would be

[NEET 2016 (Phase 2)]

- (1) 1.25×10^{-5} M (2) 1.6×10^{-9} M
(3) 1.6×10^{-11} M (4) zero

Scan or tap for the full solution



Q.11 The K_{sp} of Ag₂CrO₄, AgCl, AgBr and AgI are respectively, 1.1×10^{-12} , 1.8×10^{-10} , 5.0×10^{-13} , 8.3×10^{-17} . Which one of the following salts will precipitate last if AgNO₃ solution is added to the solution containing equal moles of NaCl, NaBr, NaI and Na₂CrO₄?

[AIPMT 2015 (Cancelled)]

- (1) AgBr (2) Ag₂CrO₄
(3) AgI (4) AgCl

Scan or tap for the full solution



Q.12 The values of K_{sp} of CaCO₃ and CaC₂O₄ are 4.7×10^{-9} and 1.3×10^{-9} respectively at 25°C. If the mixture of these two is washed with water, what is the concentration of Ca²⁺ ions in water?

[NEET 2013 (Karnataka)]

- (1) 5.831×10^{-5} M (2) 6.856×10^{-5} M
(3) 3.606×10^{-5} M (4) 7.746×10^{-5} M

Scan or tap for the full solution



Q.13 pH of a saturated solution of Ba(OH)₂ is 12. The value of solubility product (K_{sp}) of Ba(OH)₂ is

[AIPMT 2012 (Prelims)]

- (1) 3.3×10^{-7} (2) 5.0×10^{-7}
(3) 4.0×10^{-6} (4) 5.0×10^{-6}

Scan or tap for the full solution



Q.14 In qualitative analysis, the metals of group I can be separated from other ions by precipitating them as chloride salts. A solution initially contains Ag⁺ and Pb²⁺ at a concentration of 0.10 M. Aqueous HCl is added to this solution until the Cl⁻ concentration is 0.10 M. What will the concentrations of Ag⁺ and Pb²⁺ be at equilibrium?

(K_{sp} for AgCl = 1.8×10^{-10} , K_{sp} for PbCl₂ = 1.7×10^{-5})

[AIPMT 2011 (Mains)]

- (1) [Ag⁺] = 1.8×10^{-7} M, [Pb²⁺] = 1.7×10^{-6} M
(2) [Ag⁺] = 1.8×10^{-11} M, [Pb²⁺] = 8.5×10^{-5} M
(3) [Ag⁺] = 1.8×10^{-9} M, [Pb²⁺] = 1.7×10^{-3} M
(4) [Ag⁺] = 1.8×10^{-11} M, [Pb²⁺] = 1.7×10^{-4} M

Scan or tap for the full solution



Q.15 If pH of a saturated solution of Ba(OH)₂ is 12, the value of its K_{sp} is

[AIPMT 2010 (Prelims)]

- (1) 4.00×10^{-6} M³ (2) 4.00×10^{-7} M³
(3) 5.00×10^{-6} M³ (4) 5.00×10^{-7} M³

Scan or tap for the full solution



Q.16 If the concentration of OH⁻ ions in the reaction $\text{Fe(OH)}_3(\text{s}) \rightleftharpoons \text{Fe}^{3+}(\text{aq}) + 3\text{OH}^{-}(\text{aq})$ is decreased by 1/4 times, then equilibrium concentration of Fe³⁺ will increase by

[AIPMT 2008]

- (1) 64 times (2) 4 times (3) 8 times (4) 16 times

Scan or tap for the full solution



Q.17 H₂S gas when passed through a solution of cations containing HCl precipitates the cations of second group of qualitative analysis but not those belonging to the fourth group. It is because

[AIPMT 2005]

- (1) presence of HCl decreases the sulphide ion concentration
(2) solubility product of group II sulphides is more than that of group IV sulphides
(3) presence of HCl increases the sulphide ion concentration
(4) sulphides of group IV cations are unstable in HCl.

Scan or tap for the full solution



Q.18 The solubility product of a sparingly soluble salt AX₂ is 3.2×10^{-11} . Its solubility (in moles/L) is

[AIPMT 2004]

- (1) 5.6×10^{-6} (2) 3.1×10^{-4}
(3) 2×10^{-4} (4) 4×10^{-4}

Scan or tap for the full solution



Q.19 The solubility product of AgI at 25°C is 1.0×10^{-16} mol² L⁻². The solubility of AgI in 10⁻⁴ N solution of KI at 25°C is approximately (in mol L⁻¹)

[AIPMT 2003]

- (1) 1.0×10^{-16} (2) 1.0×10^{-12}
(3) 1.0×10^{-10} (4) 1.0×10^{-8}

Scan or tap for the full solution



Q.20 Solubility of MX₂ type electrolytes is 0.5×10^{-4} mole/lit., then find out K_{sp} of electrolytes.

[AIPMT 2002]

- (1) 5×10^{-12} (2) 25×10^{-10}
(3) 1×10^{-13} (4) 5×10^{-13}

Scan or tap for the full solution



Q.21 Solubility of M₂S salt is 3.5×10^{-6} then find out solubility product. [AIPMT 2001]

(1) 1.7×10^{-6}

(2) 1.7×10^{-16}

(3) 1.7×10^{-18}

(4) 1.7×10^{-12}

Scan or tap for the
full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	4	1	1	4	3	1	3	4	2	2	2
Ques.	12	13	14	15	16	17	18	19	20	21	
Ans.	4	2	3	4	1	1	3	2	4	2	