

# Worksheet: Rearranging Solubility Products



**Q1:** What is the solubility product of  $\text{La}_2(\text{MoO}_4)_3$ , given that it has a solubility of 0.00179 g per 100 mL of solution? Give your answer to three significant figures.

A  $3.26 \times 10^{-21}$

B  $8.10 \times 10^{-21}$

C  $6.40 \times 10^{-24}$

D  $7.95 \times 10^{-22}$

E  $7.36 \times 10^{-24}$

**Q2:** What is the solubility product of  $\text{NH}_4\text{MgAsO}_4 \cdot 6\text{H}_2\text{O}$ , given that it has a solubility of 0.038 g per 100 mL of solution?

A  $6.6 \times 10^{-8}$

B  $2.3 \times 10^{-9}$

C  $4.5 \times 10^{-10}$

D  $4.4 \times 10^{-9}$

E  $7.1 \times 10^{-8}$

**Q3:** What is the solubility product of  $\text{Ba}(\text{BrO}_3)_2 \cdot \text{H}_2\text{O}$ , given that it has a solubility of 0.30 g per 100 mL of solution? Give your answer to two significant figures.

A  $1.6 \times 10^{-6}$

B  $4.4 \times 10^{-5}$

C  $8.2 \times 10^{-5}$

D  $5.0 \times 10^{-6}$

E  $1.3 \times 10^{-6}$

**Q4:** What is the solubility product of  $\text{BaSeO}_4$ , given that it has a solubility of 0.0118 g per 100 mL of solution?

A  $6.03 \times 10^{-6}$

B  $5.00 \times 10^{-8}$

C  $1.39 \times 10^{-2}$

D  $6.24 \times 10^{-7}$

E  $1.77 \times 10^{-7}$

**Q5:** The solubility of TlCl (thallium(I) chloride), an intermediate formed during the isolation of thallium from ores, is 3.46 grams per liter at 20°C. What is its solubility product? Give your answer to three significant figures.

A  $3.63 \times 10^{-2}$

B  $1.58 \times 10^{-4}$

C  $2.08 \times 10^{-4}$

D  $1.32 \times 10^{-3}$

E  $1.44 \times 10^{-2}$

**Q6:** Many of the pigments used by artists in oil-based paints are sparingly soluble in water. For example, the solubility of the artist's pigment chrome yellow,  $\text{PbCrO}_4$ , is  $4.6 \times 10^{-6}$  g/L. What is the solubility product of  $\text{PbCrO}_4$ ?

A  $1.4 \times 10^{-8}$

B  $4.6 \times 10^{-6}$

C  $2.1 \times 10^{-11}$

D  $7.1 \times 10^{-9}$

E  $2.0 \times 10^{-16}$

**Q7:** A solution contains  $1.0 \times 10^{-2}$  mol of KI and 0.10 mol of KCl per liter.  $\text{AgNO}_3$  is gradually added to this solution. Which forms first, solid AgI or solid AgCl?

- A AgI
- B AgCl
- C Neither; they will form simultaneously.

**Q8:** A solution contains  $2.0 \times 10^{-5}$  mol of KBr and 0.50 mol of KCl per liter.  $\text{AgNO}_3$  is gradually added to this solution. Which forms first, solid AgBr or solid AgCl?

- A AgBr
- B AgCl
- C Neither; they will form simultaneously.

**Q9:** Which of the following is not true for a 0.1 M aqueous solution of  $\text{Ca}_3(\text{PO}_4)_2$  at equilibrium?

- A  $[\text{H}_2\text{O}] > [\text{PO}_4^{3-}]$
- B  $[\text{PO}_4^{3-}] > [\text{H}_3\text{PO}_4] + [\text{H}_2\text{PO}_4^-] + [\text{HPO}_4^{2-}]$
- C  $[\text{H}^+] > [\text{H}_3\text{PO}_4]$
- D  $[\text{H}_3\text{PO}_4] > [\text{H}_2\text{PO}_4^-]$
- E  $[\text{OH}^-] > [\text{H}^+]$