

Quiz for Video 11 – Complex Ions and Combining K values

1. What is a complex ion?

- a) A neutral molecule with multiple charges
- b) A single ion with no attached molecules
- c) A mixture of cations and anions in solution
- d) A central metal ion bonded to one or more ligands

2. What is the term for a molecule or ion that donates a pair of electrons to a metal ion in a complex ion?

- a) Catalyst
- b) Precipitate
- c) Reducing agent
- d) Ligand

3. Which of the following is a common ligand in complex ion formation?

- a) Na^+
- b) Cl_2
- c) CO_2
- d) NH_3

4. What is the coordination number of a metal ion in a complex?

- a) The number of oxidation states the metal can have
- b) The number of ligands the metal ion is bonded to
- c) The total number of atoms in the metal complex
- d) The number of donor atoms directly attached to the metal ion

5. What is the name of the equilibrium constant associated with the formation of a complex ion?

- a) K_a
- b) K_{sp}
- c) K_w
- d) K_f

6. The formation constant (K_f) for a complex ion is typically:

- a) Very small
- b) Equal to 1
- c) Negative
- d) Very large

7. How does adding a ligand such as NH_3 affect the solubility of AgCl in water?

- a) It has no effect
- b) It decreases solubility
- c) It causes precipitation
- d) It increases solubility by forming a complex ion

8. If a reaction consists of multiple equilibrium steps, how do you determine the overall equilibrium constant?

- a) Add the equilibrium constants
- b) Subtract the equilibrium constants
- c) Take the reciprocal of each equilibrium constant
- d) Multiply the equilibrium constants

9. What happens to the equilibrium position if additional binding ligand is added to a complex ion solution?

- a) The complex ion decomposes
- b) The complex ion remains unchanged
- c) The reaction shifts toward reactants
- d) The reaction shifts toward product formation, increasing complex ion concentration

10. Why do transition metals often form complex ions?

- a) They have low electronegativity
- b) They are highly reactive
- c) They lack available orbitals
- d) They have empty or partially filled d-orbitals that can accept electron pairs