

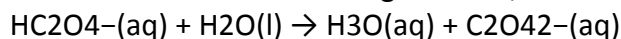
Answer on Question #66942 - Chemistry - Physical Chemistry

Question:

Question 8 : The magnitude of K_w indicates that _____.

- water autoionizes very quickly
- the autoionization of water is exothermic
- water autoionizes very slowly
- water autoionizes only to a very small extent

Question 9 : For the following reaction, which of the following is a conjugate acid-base pair?



- H_2O and $\text{C}_2\text{O}_4^{2-}$
- HC_2O_4^- and H_3O^+
- HC_2O_4^- and $\text{C}_2\text{O}_4^{2-}$
- HC_2O_4^- and H_2O

Question 10 : What's the concentration of Ag^+ ion in a saturated silver chloride solution?

$K_{sp} = 1.56 \times 10^{-10}$.

- none of these
- 0.000339 M
- 0.0000125 M
- 4.90 M

Question 11 : A substance that is capable of acting as both an acid and as a base is _____.

- conjugated
- Amphoteric
- Diprotic
- Binary acid-base

Solution:

Question 8: Autoionizes water only in very small extent, because it has low autoionization constant, $K_w = 1.0 \times 10^{-14}$ at room temperature. So the correct answer: water autoionizes only to a very small extent.

Question 9: According to the theory Brønsted-Lowry each pair of particles that are transformed into one another by joining (splitting) off of the proton forms a conjugate acid and base, as described above with suitable answers only: H_3O^+ and $\text{C}_2\text{O}_4^{2-}$. So the correct answer: H_3O^+ and $\text{C}_2\text{O}_4^{2-}$.

$$\text{Question 10: } K_{sp} = [\text{Ag}^+] \cdot [\text{Cl}^-] = [\text{Ag}^+]^2$$

$$[\text{Ag}^+] = \sqrt{K_{sp}} = \sqrt{1.56 \cdot 10^{-10}} = 0.0000125 \text{ M}$$

So the correct answer: 0.0000125 M.

Question 11: Amphoteric - the ability of the compounds exhibit acidic and basic properties. So the correct answer: Amphoteric.

Answer: Question 8: water autoionizes only to a very small extent;

Question 9: H_3O^+ and $\text{C}_2\text{O}_4^{2-}$;

Question 10: 0.0000125 M;

Question 11: Amphoteric.