1. A conjugate acid-base pair differs by...

   ☐ one H^+ ion

   ☐ one electron

   ☐ one neutron

2. Find the pH of 0.01 M HCl, neglecting water ionization.

   _____

3. A larger K_a means the weak acid is...

   ☐ stronger

   ☐ more dilute

   ☐ weaker

4. A buffer is made from...

   ☐ pure water

   ☐ a weak acid and its conjugate base

   ☐ a strong acid alone

5. For HCl titrated with NaOH, at equivalence the moles of acid initially present and base added are...

   ☐ both zero

   ☐ doubled

   ☐ equal

6. A weaker bond to hydrogen makes an acid...

   ☐ stronger

   ☐ weaker

   ☐ neutral

7. A larger K_a corresponds to a larger pK_a.

   ☐ True ☐ False

8. For a fixed total concentration of one conjugate pair, a buffer resists small pH changes best near equal acid and conjugate base.

   ☐ True ☐ False

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10. The solubility of AgCl changes strongly with pH.

    ☐ True ☐ False

1. **one H^+ ion**

   The acid loses one H^+ to become its conjugate base.

2. **2**

   $[H^+] = 10^{-2}$, so $\text{pH} = -\log(10^{-2}) = 2$.

3. **stronger**

   A bigger K_a means more ionization – a stronger weak acid.

4. **a weak acid and its conjugate base**

   Both members must remain in significant amounts; a weak base with its conjugate acid also makes a buffer.

5. **equal**

   $HCl + NaOH \rightarrow NaCl + H_2O$ is 1:1, so $n(\text{HCl}) = n(\text{NaOH})$ here; other reactions require their own mole ratio.

6. **stronger**

   A weaker covalent H-X bond can release the proton more easily in related acids; this is not an intermolecular hydrogen bond.

7. **False**

   False. $\text{p}K_a = -\log K_a$, so the negative log inverts the order: a larger K_a gives a smaller $\text{p}K_a$.

8. **True**

   At fixed total buffer concentration, a 1:1 ratio balances reserves for added acid and base. Concentration also affects capacity.

9. **5**

   $\log 1 = 0$, so $\text{pH} = \text{p}K_a = 5.0$.

10. **False**

    Chloride is an extremely weak conjugate base, so acid has little effect through protonation in the simple dissolution model.

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