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8.8 Properties of Buffers

AP Chemistry

Answer in complete sentences. Write reactions as net ionic equations.

1. Circle each pair that could be used to make a buffer. Write one short reason next to each pair you did not circle.

HCl and NaCl HF and NaF NH_3 and NH_4Cl

HNO_3 and $NaNO_3$ CH_3COOH and CH_3COONa NaH_2PO_4 and Na_2HPO_4

2. A buffer contains NH_3 and NH_4^+. Write the net ionic equation for what happens when a small amount of each is added. Name the buffer component that reacts.

(a) HCl

(b) NaOH

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3. You need a buffer with a pH near 4.50. Choose the best weak acid and its conjugate base from the list, and explain your choice.

Formic acid, HCOOH ($pK_a = 3.74$) Acetic acid, CH_3COOH ($pK_a = 4.76$)

Hypochlorous acid, HOCl ($pK_a = 7.54$) Ammonium ion, NH_4^+ ($pK_a = 9.25$)

4. A buffer contains 0.50 *M* HA and 0.50 *M* A^-. Water is added until the volume is exactly doubled.

(a) Does the pH change? Explain.

(b) Does the buffer capacity change? Explain.

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