

Problem of the Day 28 CHEM 1252

1. Like any equilibrium constant, K_w , depends on temperature. At body temperature, 37 °C or 98 °F, $K_w = 2.1 \times 10^{-14}$. What is the pH of water at body temperature?

5

2. The pH of an aqueous 0.015 M HNO_2 solution was measured to be 2.63. What is the value of K_a for HNO_2 ? *You must justify your answer with a calculation.* (Hint: Start by setting up an ICE table.)

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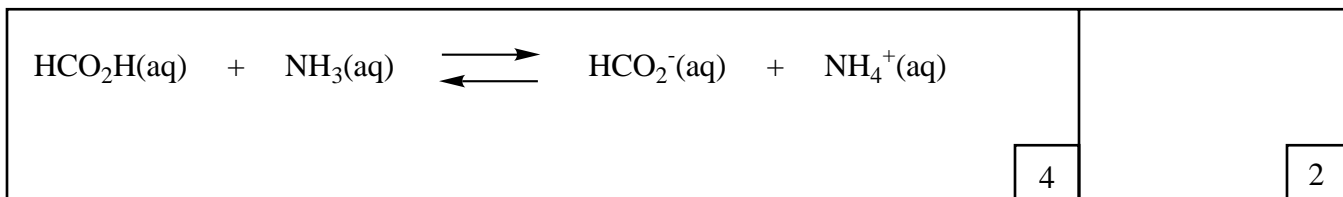
3. Calculate $[\text{H}^+]$ and $[\text{OH}^-]$ in a solution prepared by dissolving 0.525 g gaseous HCl in enough water to reach a final volume of 450 mL.

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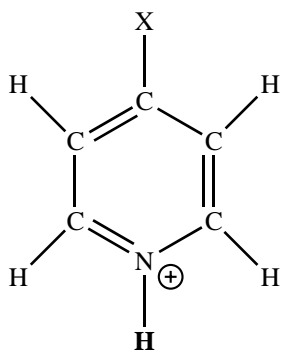
4. Calculate the pH and pOH of a solution where $[H^+] = 1.5 \times 10^{-6}$. You must show your work.

6

5. Identify the conjugate acid/base pairs in the following reaction. Predict if K_c for the reaction is greater than or less than 1.



6. Consider the following four acids. They differ only by what is connected at the "X" position and the acidic proton is bold-faced.



	I	II	III	IV
X =	NO_2	Cl	H	CH_3
K_a	5.9×10^{-2}	1.5×10^{-4}	6.8×10^{-6}	1.0×10^{-6}

Assuming the concentration of each solution is 0.100 M, place them in order of increasing pH. You must justify your answer.

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