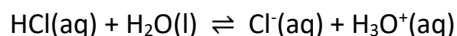


pH Calculations

1. HCl reacts with water to produce hydronium ions according to the reaction shown below.



a. What is the pH of a 20.00 mL sample of a 0.01 M HCl solution?

b. To this 20.00 mL of acid, 180.00 mL of distilled water is added. What is the pH of the resulting solution?

2. The pH of a 0.100 M HF solution is 2.1.

a. What is the $[\text{H}_3\text{O}^+]$ of the solution?

b. From what you know about the behaviour of strong and weak acids in solution, is HF a strong or weak acid? _____

Explain your reasoning with reference to your answer in a. above.

3. Give the pH of the following solutions, all at 25 °C, to the right number of significant figures:

- 0.0150 M NaOH

- 0.05 M Ca(OH)_2

- 0.151 M HCl

4. What mass, in grams, of HCL (36.5 g/mol) must be added to 100 mL of distilled water at 25 °C, to create a solution with a pH = 2.32? Give your answer to the right number of significant figures.

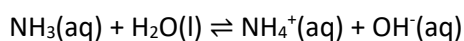
5. A 100 mL solution has a pH = 1.525?

a. Circle the correct responses from the list below.

This solution is weakly/strongly, acidic/basic.

b. What volume, in mL, of distilled water must be added to the solution to change the pH of the solution to 3.525?

6. Ammonia (NH₃) gas reacts with water, at 25 °C, according to the reaction shown below.



A pure, 2.45 gram sample of ammonia (17.0 g/mol) is placed in a 1.000 litre volume of distilled water. Calculate the pH of the solution formed if only 0.1700 grams of ammonia gas reacts with water to form hydroxide ions (OH⁻) ?