

Lecture I

Solutions and Dilutions

PROBLEM 1: We have a stock solution of HCl with a concentration of 1M. We want to prepare 100mL of HCl 0.1M. Which is the volume of the stock solution needed? How many mL of water should we add to obtain the final volume?

PROBLEM 2: How much of a 0.4 mg/mL stock solution of insulin solution is required to provide a patient with 10 micrograms (μg) of insulin?

Weak acid: K_a , pH and molarity

PROBLEM 3: The degree of dissociation of a 0.1 M acetic acid (CH_3COOH) solution is $\alpha=0.132$. What would be the pH and dissociation constant K_a of acetic acid?

PROBLEM 4: A 0.228 M solution of uric acid ($\text{HC}_5\text{H}_3\text{N}_4\text{O}_3$) has a pH of 2.39. Calculate the K_a of uric acid.