EXP. NUMBER	EXPERIMENT/SUBJECT	DATE
2	Isolation and Determination of the Isoelectric Point of Casein	[redacted]

NAME	LAB PARTNER	LOCKER/DESK NO.	COURSE & SECTION NO.
[redacted]			

Prelab Question

$NH_4^+_{(aq)} + H_2O_{(l)} \rightleftharpoons NH_{3(aq)} + H_3O^+_{(aq)}$

$K_b = 1.8 \times 10^{-5}$

$K_a = \frac{K_w}{K_b} = \frac{1 \times 10^{-14}}{1.8 \times 10^{-5}}$

$= 5.56 \times 10^{-10}$

$pK_a = -\log(5.56 \times 10^{-10})$

$= 9.26$

$pH = pK_a + \log \frac{[base]}{[acid]}$

$8.85 = 9.26 + \log x$

$10^{-0.41} = x = 0.389$

$10^{-0.41} = x = 0.389 = ratio$

Let $x = [acid]$; $y = [base]$

$\frac{y}{x} = 0.389$

$x_v + y_v = 0.075\ L$

$y_v = 0.075 - x_v$

$\frac{x}{0.075 - x} = 0.389$

$x = 0.0292 - 0.389x$

$1.389x = 0.0292$

$x = 0.021\ L$

$[acid] = 0.075 - 0.021 = 0.054\ L$

so you need 21 mL of NH_3 and 54 mL of NH_4^+.

Purpose:

The purpose of this experiment is to isolate casein (from skim milk powder) and determine its isoelectric point. The effects of acids / bases on both buffered and non-buffered solutions of casein will be examined.

Procedure:

The experiment was carried out as described in experiment 9 (Isolation and Determination of the Isoelectric Point of Casein), of the Chemistry 1A03/1AA3/1E03 Labratory Manual.

*note: to create ~ 0.1% HCl, we combined ≃ 1 mL 10% HCl with ≃ 99 mL distilled water (10x volume water for 10x dilution.

SIGNATURE	DATE	WITNESS/TA	DATE

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