

CHM 152

Quiz 5

Spring 2009
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Name Key

1. Calculate the pH of a 1.00 L buffer solution that is .30 M benzoic acid and .32 M sodium benzoate. K_a (benzoic acid, $\text{HC}_7\text{H}_5\text{O}_2$) = 6.4×10^{-5}
Show your work.

$$\text{pH} = \text{p}K_a - \log\left(\frac{[\text{HA}]}{[\text{A}^-]}\right)$$

$$\text{pH} = 4.19 - \log\left(\frac{.30}{.32}\right) = \boxed{4.22}$$

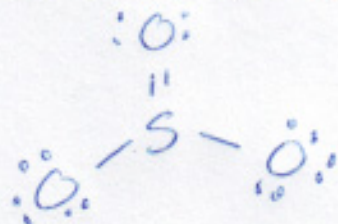
2. Calculate the pH of the buffer in #1 after the addition of .02 moles of HCl. Show your work.

$$\text{HA} \uparrow = .32$$

$$\text{A}^- \downarrow = .30$$

$$\text{pH} = 4.19 - \log\left(\frac{.32}{.30}\right) = \boxed{4.16}$$

BONUS (2) What is the shape (geometry) of the SO_3 molecule?



trigonal (planar)