

HOMEWORK #3

(due 2/6/08)

You are about to submit a paper and noticed that in the Methods section you had simply designated one of your buffers as the 'miracle buffer'. Realizing that the editor would demand to know the composition and pH you decide to calculate the molar concentrations of the components and the pH from the recipe. The recipe for miracle buffer is: 9.75 g MES (= morpholino-ethanesulfonic acid), 5.8 g NaCl, and 3.5 ml of 1 M NaOH in final volume of 100 ml. What are the molar concentrations of NaCl (Mol. Wt. = 58.44) and MES (Mol. Wt. = 195; pKa = 6.15) and the pH of the solution?

After submitting the paper you decide to make the buffer according to the recipe and measure the pH. The pH is actually less than the calculated value. Give a possible explanation(s) for the difference between the measured and calculated pH. Are there any reasons to consider changing to another buffer besides MES? Why or why not?