

Practice problems 2012

1. How would you prepare 400 ml of a 0.24 M NaCl solution (MW = 58.44 g/mole)?
2. How would you prepare 750 ml of a 0.35 M Na₂PO₄ solution (MW = 141.96 g/mole)?
3. How would you prepare 225 ml of a 0.15 M citric acid solution (453.6 g/mole)?
4. What volume of stock 0.24 M NaCl is needed to prepare 75 ml of 0.1 M NaCl?
5. What volume of stock 0.35 M Na₂PO₄ is needed to prepare 150 ml of 0.2 M Na₂PO₄?
6. What volume of stock 0.15 M citric acid is needed to prepare 230 ml of 2.5x10⁻³ M citric acid?
7. How much (ml) 3x10⁻³ M Na₂PO₄ can be prepared from 20 ml of 0.2 M Na₂PO₄?
8. If you have 35 ml of 0.1 M NaCl, is it enough to prepare 200 ml of 0.06 M NaCl?
9. For each of the following, indicate the mass (g) of reagent needed to prepare 125 ml of the indicated percent solution:

Reagent	Molecular weight	Percent solution needed (125 ml)	Mass of reagent (g)
NaCl	58.44	10 %	
Na ₂ PO ₄	141.96	4.5 %	
Citric acid	453.6	2.5 %	

10. You have 200 ml of 50X TAE. What volume of the 50X TAE is needed to prepare 25 ml of 10X TAE?
11. A protocol calls for using a working concentration of 1.5 X10⁻⁴ M boric acid. To save shelf space, you decide to make up a 20X stock solution. What will be the molarity of that stock solution?
12. You make up 1000 ml of a buffer containing 300 ml citric acid and 700 ml disodium phosphate (Na₂PO₄). If the citric acid stock solution is 0.15 M and the Na₂PO₄ stock solution is 0.35 M, what are the working concentrations of these two components in the buffer?
13. You prepare a crude extract of alpha amylase from 2.7 g of germinated barley seed in 10 ml of buffer solution. What is the extract concentration in terms of milligrams of tissue extracted per milliliter of buffer?
14. You use 0.5 ml of the extract prepared in # 13 in a total reaction volume of 6 ml. What is the working concentration of the extract in the reaction?
15. In a plate count analysis of *E. coli* cell density in a water sample you find 57 colonies on an LB agar plate inoculated with 100 ul of 10⁻⁴ diluted water sample. What is the cell density (#cells/ml) of *E. coli* in the water sample?