

7. I need 189.16g of sucrose ( $C_{12}H_{22}O_{11}$ ) to complete an experiment. All I have on hand from which to obtain the sucrose is a 0.23M solution of sucrose. What volume of solution do I require? ANS: 2.5 L

~~X~~ I am performing a reaction with silver metal and need to obtain 100.0g of silver to complete it. I don't have a scale, but do have some silver foil that has a width of 13.5cm and a thickness of  $1.2 \times 10^{-4}$  cm. If I know that the density of silver is 10.49g/mL then what length of the silver foil should I use? ANS: 5900 cm

~~$2.4 \times 10^{-3} m^3$~~

How many moles of copper do I have if I obtain a copper cube with a side measurement of 134.1mm? The density of copper is known to be 8.96g/mL. ANS: 340 mol

~~$134.1 mm \times 134.1^2 = 2340 m^3$~~

~~X~~ What is the molarity of a solution prepared by adding 75.0g of aluminum nitrate to enough water to make 5434mL of solution? What volume of the solution should I use if I need 1.5mol of nitrate for an experiment? ANS: 0.06648 mol/L, 7.7 L

$4.21 dm^3$

1)  $1.121m \times \frac{37.6 \cancel{cm^3}}{100 \cancel{cm^3}} = \cancel{800g} \cdot \frac{421m}{1m} \cdot \frac{10 \cancel{dm}}{1m} = 4.21 dm^3$

2)  $\frac{154mg}{3245g} \cdot \frac{10^3mg}{1g} \cdot \frac{10^6 \mu L}{1L} \cdot \frac{1L}{1000mL} = 4.62 \times 10^{-3} cm^3 = 7.70 \times 10^3 g$

3)  $\frac{1.215g}{1000g} \cdot \frac{1000g}{1kg} \cdot \frac{1mole}{180g} = 6.7mole$   
 $12(6) + 22 + 11(16) = 180$   
 $189.16g / 180g = 1.05mole$   
 $1.05mole \cdot 34.2g/mole = 35.9g$   
 $35.9g / 8.96g/mL = 4.01mL$   
 $4.01mL \cdot 1000 = 4010 \mu L$   
 $4010 \mu L \cdot 10^{-6} = 4.01 \times 10^{-3} m^3 = 4.01 L$

$430 mL$

4)  $6.43 \times 10^{-3} mole / 10^9 mm = 6.43 \times 10^6 mm$   
 $12(12) + 22 + 11(16) = 180$   
 $189.16g / 180g = 1.05mole$   
 $1.05mole \cdot 342g/mole = 359g$   
 $359g / 8.96g/mL = 40.1mL$   
 $40.1mL \cdot 1000 = 40100 \mu L$   
 $40100 \mu L \cdot 10^{-6} = 4.01 \times 10^{-2} m^3 = 4.01 L$

$2.4 L$