

~~Dilution~~ Dilution Worksheet (d) (KEY)

1. $M_f = \frac{M_i V_i}{V_f} = \frac{(0.416 \text{ M})(0.500 \text{ L})}{0.600 \text{ L}} = 0.347 \text{ M}$
 ~~0.089 M KCl~~ ~~0.5 M KCl~~

2. $M_f = \frac{M_i V_i}{V_f} = \frac{(6.0 \text{ M})(0.400 \text{ L})}{0.600 \text{ L}} = 4.0 \text{ M H}_2\text{SO}_4$ = ~~$4 \text{ M H}_2\text{SO}_4$~~

3. $V_f = \frac{M_i V_i}{M_f} = \frac{(3.0 \text{ M})(0.500 \text{ L})}{1.0 \text{ M}} = 1.5 \text{ L total} = 1.0 \times 10^3 \text{ mL}$
 $1.5 \text{ L} - 0.500 \text{ L} = 1.0 \text{ L H}_2\text{O added}$ = ~~$1000 \text{ mL H}_2\text{O}$~~

4. $M_f = \frac{M_i V_i}{V_f} = \frac{(0.200 \text{ M})(0.300 \text{ L})}{0.500 \text{ L}} = 0.12 \text{ M KOH}$ = ~~0.12 M KOH~~

5. $M_f = \frac{M_i V_i}{V_f} = \frac{(0.75 \text{ M})(0.020 \text{ L})}{0.090 \text{ L}} = 0.17 \text{ M HBr}$ = ~~0.2 M HBr~~

6. $M_f = \frac{M_i V_i}{V_f} = \frac{(12 \text{ M})(0.050 \text{ L})}{0.250 \text{ L}} = 2.4 \text{ M HCl}$ = ~~12 M HCl~~

7. $\frac{122 \text{ g NH}_4\text{I}}{144.9 \text{ g NH}_4\text{I}} \times 1 \text{ mol NH}_4\text{I} = 0.8420 \text{ mol NH}_4\text{I}$

$M = \frac{\text{mol}}{V} = \frac{0.8420 \text{ mol}}{0.100 \text{ L}} = 8.42 \text{ M} = M_i$

$M_f = \frac{M_i V_i}{M_f} = \frac{(8.42 \text{ M})(0.100 \text{ L})}{2.0 \text{ M}} = 0.421 \text{ L (total)}$

$0.421 \text{ L} - 0.100 \text{ L} = 0.32 \text{ L H}_2\text{O added}$ = ~~$0.3 \text{ L H}_2\text{O}$~~

8. $V_f = \frac{M_i V_i}{M_f} = \frac{(0.10 \text{ M})(0.300 \text{ L})}{0.050 \text{ M}} = 0.60 \text{ L (total)}$

$0.60 \text{ L} - 0.300 \text{ L (START)} = 0.30 \text{ L H}_2\text{O added}$ = ~~$0.3 \text{ L H}_2\text{O}$~~

9. $V_i = \frac{M_f V_f}{M_i} = \frac{(0.15 \text{ M})(0.200 \text{ L})}{0.95 \text{ M}} = 0.032 \text{ L required}$ = ~~0.03 L~~