(d) moles $SbCl_3 = 0.100 \frac{mol}{L} \times 0.2500\ L = 0.0250\ mol$

mass $SbCl_3 = 0.0250\ mol \times \frac{228.3\ g}{1\ mol} = 5.71\ g$

Dissolve 5.71 g of $SbCl_3$ in less than 250 mL of water and then dilute to 250 mL.

(e) moles NaOH $= 0.0120 \frac{mol}{L} \times 2.75\ L = 0.0330\ mol$

mass NaOH $= 0.0330\ mol \times \frac{40.0\ g}{1\ mol} = 1.32\ g$

Dissolve 1.32 g of NaOH in less than 2.75 L of water and then dilute to 2.75 L.

(f) moles $CuSO_4 \cdot 5H_2O$ = moles $CuSO_4 = 0.0300 \frac{mol}{L} \times 2.00\ L = 0.0600\ mol$

mass $CuSO_4 \cdot 5H_2O = 0.0600\ mol \times \frac{249.6\ g}{1\ mol} = 15.0\ g$

Dissolve 15.0 g of $CuSO_4 \cdot 5H_2O$ in less than 2.00 L of water and then dilute to 2.00 L.

(g) moles $BaI_2 \cdot 2H_2O$ = moles $BaI_2 = 0.225 \frac{mol}{L} \times 0.0500\ L = 0.01125\ mol$

mass $BaI_2 \cdot 2H_2O = 0.01125\ mol \times \frac{427.1\ g}{1\ mol} = 4.80\ g$

Dissolve 4.80 g of $BaI_2 \cdot 2H_2O$ in less than 50.0 mL of water and then dilute to 50.0 mL.

61. moles $AlCl_3 = 0.250 \frac{mol}{L} \times 0.3500\ L = \mathbf{0.0875\ mol}$

62. moles HCl $= 100.0\ g \times \frac{1\ mol}{36.5\ g} = 2.74\ mol$

$c = \frac{n}{V}$, so $V = \frac{n}{c} = \frac{2.74\ mol}{2.40\ mol/L} = \mathbf{1.14\ L}$

63. moles $Sr(NO_3)_2 = 1.30 \times 10^{-3} \frac{mol}{L} \times 0.0550\ L = \mathbf{7.15 \times 10^{-5}\ mol}$

64. moles NaF $= 0.15\ g \times \frac{1\ mol}{42.0\ g} = 3.57 \times 10^{-3}\ mol$

$c = \frac{n}{V}$, so $V = \frac{n}{c} = \frac{3.57 \times 10^{-3}\ mol}{2.8 \times 10^{-2}\ mol/L} = \mathbf{0.13\ L}$

65. $[H_2O] = 1000 \frac{g}{L} \times \frac{1\ mol}{18.0\ g} = \mathbf{55.6\ M}$

66. $[CH_3COOH] = 1049 \frac{g}{L} \times \frac{1\ mol}{60.0\ g} = \mathbf{17.5\ M}$

67. $d = 17.6 \frac{mol}{L} \times \frac{100.5\ g}{1\ mol} = \mathbf{1.77 \times 10^3 \frac{g}{L}}$

68. $d = 16.6 \frac{mol}{L} \times \frac{76.2\ g}{1\ mol} = \mathbf{1.26 \times 10^3 \frac{g}{L}}$

69. moles $CaCl_2 = 0.0350 \frac{mol}{L} \times 0.225\ L = 7.88 \times 10^{-3}$ mol

mass $= 7.88 \times 10^{-3}$ mol $\times \frac{111.1\ g}{1\ mol}$ = **0.875 g**

70. moles $Na_3PO_4$ = moles $Na_3PO_4 \cdot 12H_2O = 0.175 \frac{mol}{L} \times 3.45\ L = 0.604$ mol

mass $Na_3PO_4 = 0.604$ mol $\times \frac{164.0\ g}{1\ mol}$ = **99.0 g**

71. moles $C_6H_5COOH = 0.0100 \frac{mol}{L} \times 0.3500\ L = 3.50 \times 10^{-3}$ mol

mass $C_6H_5COOH = 3.50 \times 10^{-3}$ mol $\times \frac{122.0\ g}{1\ mol}$ = **0.427 g**

Now to find the mass of the acetone. Since $d = \frac{m}{V}$, then $m = d \cdot V$

and mass acetone $= 0.790 \frac{g}{mL} \times 350.0\ mL$ = **277 g.**

Since the volume of solvent used was 350 mL (about a "pop-can-full"), the addition of less than half a gram of solid (about a "pinch") would not appreciably change the volume.

72. (a) $\frac{1}{3}$ OJ (b) $\frac{1}{4}$ OJ (c) $\frac{1}{10}$ OJ (d) $\frac{2}{4}$ OJ = $\frac{1}{2}$ OJ (e) $\frac{1}{5}$ OJ (f) $\frac{3}{8}$ OJ

73. diluted concentration = $\frac{\mathbf{C}}{\mathbf{C + W}}$ OJ

74. (a) The amount of orange juice is not changed and the total volume is unchanged from that produced when water is used instead of apple juice. Therefore the orange juice is diluted to the same extent, regardless of whether apple juice or water is added.

(b) diluted concentration of apple juice = $\frac{1}{2}$ AJ

(c) i) diluted orange = $\frac{1}{2}$ OJ ; diluted apple = $\frac{1}{2}$ AJ

ii) diluted orange = $\frac{1}{3}$ OJ ; diluted apple = $\frac{2}{3}$ AJ

iii) diluted orange = $\frac{1}{4}$ OJ ; diluted apple = $\frac{3}{4}$ AJ

iv) diluted orange = $\frac{2}{5}$ OJ ; diluted apple = $\frac{3}{5}$ AJ

v) diluted orange = $\frac{1}{2}$ OJ ; diluted apple = $\frac{1}{2}$ AJ

vi) diluted orange = $\frac{2}{5}$ OJ ; diluted apple = $\frac{3}{5}$ AJ

75. diluted orange = $\frac{\mathbf{O}}{\mathbf{O + A}}$ OJ ; diluted apple = $\frac{\mathbf{A}}{\mathbf{O + A}}$ AJ

76. diluted orange = $\frac{\mathbf{O}}{\mathbf{O + A}} \times 0.8$ OJ ; diluted apple = $\frac{\mathbf{A}}{\mathbf{O + A}} \times 0.7$ AJ