Review (Ionic Eq'ns & Molarity) Key

(1) All dissociate except (m) and (l)

(2) $mol = MV = (0.64\,M)(0.5\,L) = 0.32\,mol\ MgI_2 \left| \frac{2\,mol\ I^-}{1\,mol\ MgI_2} \right. = 0.64\,mol\ I^-$

$MgI_2 \longrightarrow Mg^{2+} + 2I^-$

$= \boxed{0.6\,mol.}$

(3) $mol = MV = (0.75\,M)(0.200\,L) = 0.15\,mol\ AgNO_3 \left| \frac{169.9\,g}{1\,mol} \right. = \boxed{25\,g\ AgNO_3}$

(4) $mol = MV = (0.50\,M)(0.050\,L) = 0.025\,mol \left| \frac{331.2\,g}{1\,mol} \right. = \boxed{8.3\,g\ Pb(NO_3)_2}$

(5) $0.600\,g\ Pb^{2+} \left| \frac{1\,mol}{207.2\,g} \right. = 0.002896\,mol\ Pb^{2+} \left| \frac{1\,mol\ Pb(NO_3)_2}{1\,mol\ Pb^{2+}} \right. = 0.002896\,mol\ Pb(NO_3)_2$

$Pb(NO_3)_2 \longrightarrow Pb^{2+} + 2NO_3^-$

$V = \frac{mol}{M} = \frac{0.002896\,mol}{2.00\,M}$

$= 0.00145\,L = \boxed{1.45\,mL}$

(6) $V_f = \frac{M_i V_i}{M_f} = \frac{(1.25\,M)(0.250\,L)}{0.500\,M} = 0.625\,L$

$0.625\,L - 0.250\,L = 0.375\,L = \boxed{0.38\,L\ water}$

(7) a) $mol\ NaOH = 1.20\,g \left| \frac{1\,mol}{40.0\,g} \right. = 0.03\,mol \quad M = \frac{mol}{V} = \frac{0.03\,mol}{0.025\,L} = \boxed{1.2\,M}$

b) $mol\ Ba(OH)_2 = 3.43\,g \left| \frac{1\,mol}{171.3\,g} \right. = 0.02002\,mol \quad M = \frac{mol}{V} = \frac{0.02002\,mol}{2.50\,L} = \boxed{0.00801\,M}$

c) mol H_3PO_4 = $1.47\,g\ H_3PO_4 \left| \frac{1\ mol}{98.0\,g} \right.$ = 0.015 mol H_3PO_4 $M = \frac{mol}{V} = \frac{0.015\ mol}{0.040\,L}$ = **0.375 M**

d) $M = \frac{0.65\ mol}{0.250\,L}$ = **2.6 M**

e) $45\,g\ glucose \left| \frac{1\ mol}{180.0\,g} \right.$ = 0.25 mol

$M = \frac{0.25\ mol}{1.0\,L}$ = **0.25 M**

f) $18\,g\ glucose \left| \frac{1\ mol}{180.0\,g} \right.$ = 0.100 mol $M = \frac{0.100\ mol}{0.200\,L}$ = **0.5 M**

(8) $50.0\,L\ HCl_{(g)} \left| \frac{1\ mol}{22.4\,L} \right.$ = 2.2321 mol HCl

$M = \frac{2.2321\ mol}{2.00\,L}$ = **1.12 M**

(9) $M_f = \frac{M_i V_i}{V_f} = \frac{(12.0\,M)(1\,L)}{20\,L}$ = **0.6 M**

(10) $mol = MV = (1.00\,M)(0.001\,L)$ = $0.001\ mol \left| \frac{6.02 \times 10^{23}\ molec.}{1\ mol} \right.$ = **6.02×10^{20} molec.**

(11) OMIT (12) OMIT

(13) $M_f = \frac{M_i V_i}{V_f}$ #1

$= \frac{(6.00\ M)(0.006\ L)}{0.010\ L} = 3.6\ M\ H_2SO_4$

$M_f = \frac{M_i V_i}{V_f}$ #2

$= \frac{(0.300\ M)(0.004\ L)}{0.010\ L} = 0.12\ M\ H_2SO_4$

Total M = 3.6 M + 0.12 M = **3.72 M**

(14) mol $CuCl_2$ = (0.2 M)(1.0 L) = 0.20 mol $CuCl_2$ $\quad CuCl_2 \longrightarrow Cu^{2+} + 2Cl^-$

$$\frac{0.20\ mol\ CuCl_2}{1\ mol\ CuCl_2} \Big| \frac{2\ mol\ Cl^-}{} = \frac{0.40\ mol\ Cl^-}{1\ mol\ Cl^-} \Big| \frac{1\ mol\ AgCl}{}$$

$Ag^+ + Cl^- \longrightarrow AgCl$

$$= 0.40\ mol\ AgCl \Big| \frac{143.4\ g}{1\ mol} = \boxed{57\ g}$$

(15) $500.0\ g\ NaHSO_4 \Big| \frac{1\ mol}{120.1\ g} = 4.1632\ mol$

$$V = \frac{mol}{M} = \frac{4.1632\ mol}{0.750\ M} = \boxed{5.55\ L}$$

(16) $AuCl_3 \longrightarrow Au^{3+} + 3Cl^-$

$M = \frac{0.60\ mol}{1.0\ L} = 0.60\ M$

$[Au^{3+}] = 0.60\ M$

$[Cl^-] = 1.8\ M$