Ch2 Atoms, Molecules + Ions Exercises

31) sample 1 $\frac{44.8\text{g Cl}}{38.9\text{g C}} = 11.5$ $\frac{13.4\text{g Cl}}{14.8\text{g C}} = 9.05$ No

43) find ratio of charge for each compared to smallest (-) value

$\frac{-6.9\times10^{-19}\text{C drop A}}{-4.6\times10^{-19}\text{C drop D}} = 1.5$ $\frac{-9.2}{-4.6}$ B D $= 2$ $\frac{-11.5}{-4.6} = 2.5$ Not whole #s

Can convert to whole #s by x2 therefore charge on electron has to be ½ the smallest value ½ (4.6) $= -2.3\times10^{-19}$C

45) $-15\,\mu\text{C}\times\frac{1\text{C}}{10^6\,\mu\text{C}}\times\frac{1\,e^-}{-1.6\times10^{-19}\text{C}} = 9.4\times10^{13}\,e^-\times\frac{9.1\times10^{-28}\text{g}}{1e^-} = 8.5\times10^{-14}\text{g}$

52a) $^{65}_{29}Cu$

67) a) Na - alkali b) I - halogen c) Ca - alkaline earth d) Ba - alkaline earth e) Kr - noble gas

b) $^{63}_{29}Cu$

69) Cl + F group 7 75) 0.574(120.9038) + 0.426(122.9042) = 121.8amu Sb 121.757

77) 79.904amu = 0.5069(x) + 0.4931(80.9163amu) x = 78.92amu → Br-79

100) Sample mass = 12.3849g I + 1.00070g ^{129}I = 13.3856g

$\frac{12.3849\text{g}}{13.3856\text{g}} = 0.925240557$ fraction I $\frac{1.00070\text{g}}{13.3856\text{g}} = 0.07475944$ fraction ^{129}I

(0.925240557)(126.9045amu) + (0.07475944)(128.9050amu) = 127.054amu

106) neutron $V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(1.0\times10^{-13}\text{cm})^3 = 4.19\times10^{-39}\text{cm}^3$

$D = \frac{m}{V} = \frac{1.00866\text{amu}}{4.19\times10^{-39}\text{cm}^3}\times\frac{1.661\times10^{-24}\text{g}}{1\text{amu}} = 3.99\times10^{14}\text{g/cm}^3$

Star $V = \frac{4}{3}\pi(0.10\text{mm})^3\frac{(1\text{cm})^3}{(10\text{mm})^3} = 4.19\times10^{-6}\text{cm}^3$

$m = 4.19\times10^{-6}\text{cm}^3\times\frac{3.99\times10^{14}\text{g}}{\text{cm}^3}\times\frac{1\text{Kg}}{1000\text{g}} = 1.7\times10^{6}\text{Kg}$

120) Cl_2O possible combos $^{35}Cl\,^{35}Cl\,^{16}O$ $^{35}Cl\,^{37}Cl\,^{16}O$ $^{37}Cl\,^{37}Cl\,^{16}O$ 9 combos

O-16 most abundant $^{35}Cl\,^{35}Cl\,^{17}O$ $^{35}Cl\,^{37}Cl\,^{17}O$ $^{37}Cl\,^{37}Cl\,^{17}O$ O-17, O-18 < 18

$^{35}Cl\,^{35}Cl\,^{18}O$ $^{35}Cl\,^{37}Cl\,^{18}O$ $^{37}Cl\,^{37}Cl\,^{18}O$

Masses $^{35}Cl\,^{35}Cl\,^{16}O = 34.9688 + 15.9949 + 15.9949 = 85.9325$amu

$^{35}Cl\,^{37}Cl\,^{16}O = 87.9296$amu $^{37}Cl\,^{37}Cl\,^{16}O = 89.9267$amu