Chemistry 115 Name Key

Dr. Cary Willard

Quiz 5a (20 points) March 11, 2010

Must show all work to receive credit. Use proper significant figures.

Avogadro’s number – 6.022 x 1023 particles/mol

1. (8 points) Give the appropriate name or formula as appropriate.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Formula |  | Formula | Name |
| Sodium sulfite | Na2SO3 |  | Mg(BrO4)2 | Magnesium perbromate |
| Aluminum periodate | Al(IO4)3 |  | Cu3N | Copper(I) nitride |
| lead(II) nitrate | Pb(NO3)2 |  | Zn3(PO4)2 | Zinc phosphate |
| Phosphorous pentachloride | PCl5 |  | K3BO3 | Potassium borate |

1. (6 points) Determine the mass of Ca3(PO4)2 that contains 9.76 x 1021 atoms of phosphorus.

$$?g Ca\_{3}\left(PO\_{4}\right)\_{2}=9.76×10^{21}atom P×\frac{1 mol P}{6.022×10^{23}atom P}×\frac{1 mol Ca\_{3}\left(PO\_{4}\right)\_{2}}{2 mol P}×\frac{310.2 g Ca\_{3}\left(PO\_{4}\right)\_{2}}{1 mol Ca\_{3}\left(PO\_{4}\right)\_{2}}=2.51 g Ca\_{3}\left(PO\_{4}\right)\_{2}$$

1. (6 points) The percent composition of chromium arsenide is 48.06% Cr and 51.94% As. Calculate the empirical formula of chromium arsenide.

$$?mol Cr=48.06 g Cr×\frac{1 mol Cr}{52.00g Cr}=0.9242 mol Cr$$

$$?mol As=51.94 g As×\frac{1 mol As}{74.92 g As}=0.6933 mol As$$

$$Cr\_{\frac{0.9242}{0.6933}}As\_{\frac{0.6933}{0.6933}} \rightarrow Cr\_{1.333}As\_{1} \rightarrow Cr\_{4}As\_{3}$$

Chemistry 115 Name Key

Dr. Cary Willard

Quiz 5b (20 points) March 9, 2010

Must show all work to receive credit. Use proper significant figures.

Avogadro’s number – 6.022 x 1023 particles/mol

1. (8 points) Give the appropriate name or formula as appropriate.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Formula |  | Formula | Name |
| potassium sulfate | K2SO4 |  | Ca(ClO)2 | Calcium hypochlorite |
| Lead (IV) carbonate | Pb(CO3)2 |  | SnS2 | Tin(IV) sulfide |
| Barium perbromate | Ba(BrO4)2 |  | Zn3(PO3)2 | Zinc phosphate |
| Arsenic triiodide | AsI3 |  | Ti(NO3)3 | Titanium(III) nitrate |

1. (6 points) Determine the mass of Ca3(PO4)2 that contains 8.42 x 1021 atoms of phosphorus.

$$?g Ca\_{3}\left(PO\_{4}\right)\_{2}=8.42×10^{21}atom P×\frac{1 mol P}{6.022×10^{23}atom P}×\frac{1 mol Ca\_{3}\left(PO\_{4}\right)\_{2}}{2 mol P}×\frac{310.2 g Ca\_{3}\left(PO\_{4}\right)\_{2}}{1 mol Ca\_{3}\left(PO\_{4}\right)\_{2}}=2.17 g Ca\_{3}\left(PO\_{4}\right)\_{2}$$

1. (6 points) The percent composition of manganese sulfide is 56.24% Mn and 43.76% S. Calculate the empirical formula of manganese sulfide.

$$?mol Mn=56.24 g Mn×\frac{1 mol Mn}{54.94 g Mn}=1.024 mol Mn$$

$$?mol S=43.76 g S×\frac{1 mol S}{32.06 g S}=1.365 mol S$$

$$Mn\_{\frac{1.024}{1.024}}S\_{\frac{1.365}{1.024}} \rightarrow Mn\_{1}S\_{1.333} \rightarrow Mn\_{3}S\_{4}$$