**Chem 1013: mini-quiz # 14: molecular formula and % composition A 4 pts March 9**

Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. A compound containing 48 g S and 48 g O has a molecular weight of 256 g/mol. What is the **molecular**

 **formula** for the compound SxOy ?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| element | w=mass,g | GAW (g/mol) | w/GAW=n(mol) | n/nmin |
| S | 48 | 32 | 48/32=1.5 | 1 |
| O | 48 | 16 | 48/16=3 | 2 |

Molecular mass of SO2 =1\* 32 + 2\*16=64 256/64=4

Molecular formula for SxOy: \_\_\_\_S4O8\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (2 pts)

2. A 128 gram sample of pure S, a yellow powder, is burned in oxygen, O to produce 256 g of a

 horrible smelling gas, SOx. Given that the atomic mass of S = 32 g/mol and the atomic mass of O=16

 g/mol what is the empiric formula for SOx, e.g., what is x ?

 mass O= 256-128=128 g=> mol O = 128/16=8

 mass S =128 g=> mol S=128/32=4

 S4O8🡪 SO2

 Formula for SOx = \_\_\_SO2\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (2 pts)

**Chem 1013: mini-quiz # 14: molecular formula and % composition B 4 pts March 9**

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1. A compound containing 42 g N and 32 g O has a molecular weight of 296 g/mol. What is the

 **molecular formula** for the compound NxOy ?

|  |  |  |  |
| --- | --- | --- | --- |
| element | w=mass,g | GAW (g/mol) | w/GAW=n(mol) |
| N | 42 | 14 | 42/14=3 |
| O | 32 | 16 | 32/16=2 |

MW of N3O2= 3\*14+2\*16=74 296/74=4

Molecular formula for NxOy: \_\_\_\_\_\_N12O8\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (2 pts)

2. A 153 gram sample of pure V (vanadium), a dull grey powder, is burned with sulfur S, a yellow powder to produce 345 g of a shiny red compound VSx. Given that the atomic mass of V = 51 g/mol and the atomic mass of S=32 g/mol what is the empiric formula for VSx, e.g., what is x ?

Grams S in VSx = 345-153=192 g=> mol S=192/32=6 mol

Grams V= 153=> mol V=153/51=3 mol

 V3S6🡪 VS3

 Formula for VSx = \_\_VS3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (2 pts)