

Quiz 1

Name: Key

SHOW ALL WORK. NO WORK = NO CREDIT.

Describe what is meant by "chemical potential energy" in three sentences or less.

3 pts

The tendency for a chemical species to react is chemical potential energy

1 pt

What is X in the following symbol?  ${}^{80}_{35}\text{X}$

Br (atomic # = 35)

Let's say that gallium (Ga) was recently found to have a second isotope, called "neogallium." A naturally occurring sample of gallium has an apparent atomic mass of 69.72 amu and contains the following isotopes:

5 pts

Ga-69	68.9256 amu	60.11%
neogallium	? amu	39.89%

Calculate the atomic mass of neogallium in amu (report your answer to 4 significant figures).

$$69.72 \text{ amu} = (0.6011)(68.9256 \text{ amu}) + (0.3989)x$$

$$69.72 = 41.43 + 0.3989x$$

$$28.27 = 0.3989x$$

$$x = 70.87 \text{ amu}$$

Calculate the mass (in nanograms,  $1 \text{ ng} = 10^{-9} \text{ g}$ ) of  $2.33 \times 10^{20}$  atoms of oxygen.

4 pts

$$2.33 \times 10^{20} \text{ atoms O} \times \frac{1 \text{ mole O}}{6.02 \times 10^{23} \text{ atoms O}} \times \frac{15.9994 \text{ g O}}{1 \text{ mole O}} \times \frac{1 \text{ ng}}{10^{-9} \text{ g}} =$$

$$6.19 \times 10^6 \text{ ng oxygen}$$