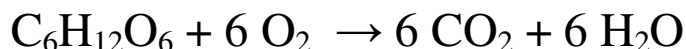


Mole ratios/mass-mole conversion CHM 109

F 09

(gram → mole → mole → gram)

How many moles (and grams?) of CO₂ are produced when you metabolize a Snickers Bar? One web source gives 34.1 g of sugar/bar. For our purposes we will assume the sugar is all glucose (C₆H₁₂O₆) and it is metabolized 100% by the rxn shown below. (While neither of these is exactly correct, the calculation still will be pretty close to the real outcome.)



1. First do a mass of glucose to moles of glucose conversion.

a) Need molecular weight (or molar mass) of glucose

Molecular wt (molar mass) of C₆H₁₂O₆:
C: 6 x 12.011 = 72.066 g C per mole C₆H₁₂O₆
H: 12 x 1.00794 = 12.09528 g H per mole C₆H₁₂O₆
O: 6 x 15.994 = 95.9964 g O per mole C₆H₁₂O₆

180.15768 g/mole C₆H₁₂O₆

b) Now do the mass to mole:

$$34.1 \text{ g C}_6\text{H}_{12}\text{O}_6 \times \frac{1 \text{ mole}}{180.15768 \text{ g C}_6\text{H}_{12}\text{O}_6} = \text{_____ mole C}_6\text{H}_{12}\text{O}_6$$

2. Next do the mole C₆H₁₂O₆ to mole CO₂ conversion. This requires you to use the coefficients from the balance equation.

$$\text{_____ mole C}_6\text{H}_{12}\text{O}_6 \times \frac{6 \text{ mole CO}_2}{1 \text{ mole C}_6\text{H}_{12}\text{O}_6} = \text{_____ mole CO}_2$$

3. Now convert moles CO₂ back to mass of CO₂ conversion.

a) Need molecular weight (or molar mass CO₂)

b) Now convert moles of CO₂ back into grams of CO₂.

For an upcoming homework assignment, you will need to convert from grams of one component to moles of another (steps 1 and 2)