

### Answer on Question #50342, Chemistry, Other

How many molecules does 36.0 grams of water represent?

How many moles does 80.0 grams of H<sub>2</sub>O represent?

How many moles does 45.0 grams of C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> represent?

How many moles does 22.0 grams of CO<sub>2</sub> represent?

How many moles does 56.0 grams of N<sub>2</sub> represent?

#### Solution:

$$n = \frac{m}{M_r} = \frac{N}{N_a}$$

$$M_r(\text{H}_2\text{O}) = 18 \text{ g/mol}$$

$$M_r(\text{C}_6\text{H}_{12}\text{O}_6) = 180 \text{ g/mol}$$

$$M_r(\text{CO}_2) = 44 \text{ g/mol}$$

$$M_r(\text{N}_2) = 28 \text{ g/mol}$$

$$N_a = 6.02 \times 10^{23}$$

36.0 g of water represents:

$$N = \frac{m \times N_a}{M_r} = \frac{36 \text{ g} \times 6.02 \times 10^{23} \text{ 1/mol}}{18 \text{ g/mol}} = 12.04 \times 10^{23}$$

**Answer 1:**

**12.04 × 10<sup>23</sup> particles**

80.0 grams of H<sub>2</sub>O represents:

$$n = \frac{m}{M_r} = \frac{80 \text{ g}}{18 \text{ g/mol}} = 4.44 \text{ mol}$$

**Answer 2:**

**4.44 moles**

45.0 grams of C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> represents:

$$n = \frac{m}{M_r} = \frac{45 \text{ g}}{180 \text{ g/mol}} = 0.25 \text{ mol}$$

**Answer 3:**

**0.25 moles**

22.0 grams of CO<sub>2</sub> represents:

$$n = \frac{m}{M_r} = \frac{22 \text{ g}}{44 \text{ g/mol}} = 0.5 \text{ mol}$$

**Answer 4:**

**0.5 moles**

56.0 grams of N<sub>2</sub> represents:

$$n = \frac{m}{M_r} = \frac{56 \text{ g}}{28 \text{ g/mol}} = 2 \text{ mol}$$

**Answer 5:**

**2 moles**