**Mole Problem**

Using your knowledge of mole calculations and unit conversions, determine how many atoms there are in 1 gallon of gasoline. Assume that the molecular formula for gasoline is C6H14 and that the density of gasoline is approximately 0.85 grams/mL.

There are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms in 1 gallon of gasoline.

**Mole Problem – Solution**

Using your knowledge of mole calculations and unit conversions, determine how many atoms there are in 1 gallon of gasoline. Assume that the molecular formula for gasoline is C6H14 and that the density of gasoline is approximately 0.8500 grams/mL.

**Using a conversion factor of 3785 mL per gallon, we can determine that the mass of gasoline in one gallon is 3785 mL x 0.8500 g/mL = 3217 grams.**

**Because the molar mass of C6H14 is 86 g/mole, there are 3217 / 86 moles of gasoline molecules, or 37.4 moles of molecules present.**

**Multiplying 37.4 x 20 (the number of atoms per mole of gasoline), there are 748 moles of atoms.**

**Finally, multiplying 748 moles of atoms by 6.02 x 1023 atoms/mole, we can find that there are 4.50 x 1025 atoms present in the sample.**

There are **4.50 x 1025** atoms in 1 gallon of gasoline.