Answer on Question #56693 – Chemistry – General Chemistry

Question:

How many grams of oxygen are in $5.89*10^{23}$ formula units of $(NH_4)_2SO_4$?

Express your answer to three significant figures and include the appropriate units.

Answer:

From the definition of mole (unit of measurement for amount of a substance):

$$n = \frac{N}{N_A} = \frac{m}{M}$$

where N is number of molecules of a substance, N_A is Avogadro constant ($6.02*10^{23}$ mol^{-1}), n is the amount of substance (mol), m is the mass of substance (g) and M is the molar mass of substance (g/mol)

Then

$$m = \frac{M*N}{N_A} = \frac{132.14*5.89*10^{23}}{6.02*10^{23}} = 129.29 \approx 129 \, g$$

Answer: 129 g.