Answer on Question #59749, Chemistry / General Chemistry

1. How many moles of N are in 2.50g of caffeine?

Solution:

Formula of caffeine - $C_8H_{10}N_4O_2$

Molar mass – 194 g/mol

In one molecule of caffeine contains 4 atoms of nitrogen:

In 194 g/mol ($C_8H_{10}N_4O_2$) – 4×14g/mol (N)

In 2.5g ($C_8H_{10}N_4O_2$) – X (N)

$$X\ (N) = \frac{2.5g \times 56g/mol}{194\ g/mol} = 0.725g.$$

$$n = \frac{m}{M} = \frac{0.725}{14} = 0.05\ mol$$

Answer: n = 0.05 mol.