

Solutions

Isotope	Symbol	Mass #	# Neutrons	# Protons
Radium-228	${}^{228}_{88}\text{Ra}$	228	140	88
Sodium-24	${}^{24}_{11}\text{Na}$	24	13	11
Bromine-80	${}^{80}_{35}\text{Br}$	80	45	35
Krypton-78	${}^{78}_{36}\text{Kr}$	78	42	36

②

$$N = N_A \cdot n$$

$$= (6.02 \times 10^{23} \text{ atoms/mol}) (6.67 \times 10^{-2} \text{ mol})$$

$$= 4.02 \times 10^{22} \text{ atoms of He}$$

③ a) Each molecule contains 17 atoms of Carbon ($\text{C}_{17}\text{H}_{21}\text{NO}_4$)
 (ie 1 molecule; 17 carbon atoms)

To determine the # of molecules:

$$8.87 \times 10^{18} \text{ Carbon Atoms} \times \frac{1 \text{ molecule}}{17 \text{ Carbon Atoms}} = 5.22 \times 10^{17} \text{ molecules}$$

b)

$$n = \frac{N}{N_A} = \frac{5.22 \times 10^{17} \text{ molecules}}{6.02 \times 10^{23} \text{ molecules/mol}} = 8.67 \times 10^{-7} \text{ mol}$$

④ Molar Mass:

$$\begin{aligned} & (17 \times 12.01 \text{ g/mol}) \\ & + (21 \times 1.01 \text{ g/mol}) \\ & + (1 \times 14.01 \text{ g/mol}) \\ & + (4 \times 16.00 \text{ g/mol}) \\ \hline & 303.39 \text{ g/mol} \end{aligned}$$

$$m = n \times M$$

$$= (8.67 \times 10^{-7} \text{ mol}) (303.39 \frac{\text{g}}{\text{mol}}) = 2.63 \times 10^{-4} \text{ g}$$