

Answer on Question #62893 - Chemistry - Organic Chemistry

Country A releases 60 billion metric tons of CO₂ into the atmosphere. Calculate the mass of carbon in this quantity of CO₂.

Solution

Each carbon (IV) oxide molecule contains one Carbon atom. Therefore, the amount of Carbon equals the amount of CO₂:

$$v(C) = v(CO_2)$$

The amount of CO₂ can be estimated as:

$$v(CO_2) = \frac{m(CO_2)}{M(CO_2)}$$

Therefore, the mass of carbon is:

$$m(C) = v(C) \times M(C) = \frac{m(CO_2)}{M(CO_2)} \times M(C) = \frac{6 \times 10^{10} \text{ tons}}{44.01 \text{ g/mol}} \times 12.01 \frac{\text{g}}{\text{mol}} \approx 1.64 \times 10^{10} \text{ tons}$$

Answer: 16.4 billion metric tons

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