

Answer on Question #54688 – Chemistry – General chemistry

Question:

The relative isotopic mass of this isotope is 39.961 but the relative atomic mass of argon is 39.948. What can you deduce about the other isotopes of argon?

Answer:

The relative atomic mass is defined by the equation:

$M(\text{RAM}) = (aM_1 + bM_2 + cM_3)/100\%$, where a, b, c – the abundances of isotopes and M_1, M_2, M_3 – the atomic masses of isotopes.

Since $M(\text{RAM}) = 39.948 < M_1 = 39.961$, it can be deduced that:

- a) This is the main isotopes, and others have low abundances;
- b) Relative isotopic masses of the other isotopes should be less than M_1 .

In fact, Argon has 3 stable isotopes with the following abundances and isotopic masses:

- 1) 99.6 %, $M_1 = 39.961$
- 2) 0.34 %, $M_2 = 35.968$
- 3) 0.06%, $M_3 = 37.963$