

## Answer on Question #72544 - Chemistry - General Chemistry

### Question:

How many molecules are there in a 1.27 kg sample of Lithium Carbonate {  $\text{Li}_2\text{CO}_3$  }?

- A.  $1.897 \times 10$  molecules
- B.  $18.97 \times 10^{24}$  molecules
- C.  $1.03 \times 10^{23}$  molecules
- D.  $1.03 \times 10^{24}$  molecules
- E.  $1.03 \times 10^{25}$  molecules

### Solution:

The number of the molecules can be easily calculated from the number of the moles, as one mole of the molecular substance contains Avogadro's number of the molecules. The number of the moles is the ratio of the mass and molar mass:

$$n(\text{Li}_2\text{CO}_3) = \frac{1.27 \cdot 10^3(\text{g})}{73.891 \left(\frac{\text{g}}{\text{mol}}\right)} = 17.187(\text{mol}).$$

And the number of the molecules is then:

$$N = n \cdot N_A = 17.187(\text{mol}) \cdot 6.022 \cdot 10^{23}(\text{mol}^{-1}) = 1.035 \cdot 10^{25}.$$

**Answer:** E.  $1.03 \times 10^{25}$  molecules

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