

#63899 Chemistry, General Chemistry

You are given a sample of calcium carbonate in the form of a small cube measuring 4.802 inches on each side. If calcium carbonate has a density of  $2.71 \text{ g/cm}^3$ , how many oxygen atoms does it contain?

**Answer:**

$$1 \text{ inch} = 2.54 \text{ cm}$$

$$4.802 \text{ inches} = 12.197 \text{ cm}$$

$$\rho = m/V$$

$$m = \rho \cdot V$$

$$m = 2.71 \cdot 12.197^3 = 4917.319 \text{ g}$$

$$n = m/M$$

$$M(\text{CaCO}_3) = 100.086 \text{ g/mol}$$

$$n(\text{CaCO}_3) = 4917.319/100.086 = 49.131 \text{ mol}$$

$$N_A = 6.022140857(74) \times 10^{23} \text{ mol}^{-1}$$

$$N(\text{O}) = (49.131 \text{ mol} \cdot 6.022140857(74) \times 10^{23} \text{ mol}^{-1})/5 \cdot 3 = 177.523 \times 10^{23}$$

Answer provided by [www.AssignmentExpert.com](http://www.AssignmentExpert.com)