
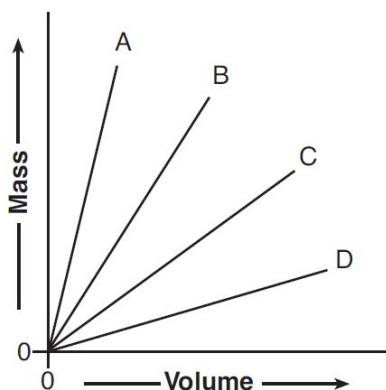


<b>W</b>	<b>108 Density</b>	
	<b>Objectives</b> 1. Define density 2. Determine density of regular objects 3. Determine density of irregular objects 4. Calculate density, mass, or volume given the other two	

- At 298 K and 1 atm, which noble gas has the lowest density?  
 (1) Ne                      (2) Kr                      (3) Xe                      (4) Rn
- Which element has the greatest density at STP?  
 (1) calcium                      (2) carbon                      (3) chlorine                      (4) copper
- Calculate the density of a 129.5 gram sample of bronze that has a volume of 14.8 cm<sup>3</sup>. Include a correct numerical setup and the calculated result.

- An inflated airbag containing N<sub>2</sub>(g) has a volume of 5.00 x 10<sup>4</sup> cm<sup>3</sup> at STP. The density of N<sub>2</sub> (g) at STP is 0.00125 g/cm<sup>3</sup>. What is the total number of grams of N<sub>2</sub>(g) in the airbag.

The graph below shows the volume and the mass of four different substances at STP.



Which of the four substances has the lowest density?

- A
- B
- C
- D

The densities for two forms of carbon at room temperature are listed in the table below.

### Densities of Two Forms of Carbon

Element Form	Density (g/cm <sup>3</sup> )
carbon (graphite)	2.2
carbon (diamond)	3.513

Compare the number of carbon atoms in a 0.30 cm<sup>3</sup> sample of graphite and a 0.30 cm<sup>3</sup> sample of diamond.

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A student measures the mass and volume of a sample of copper at room temperature and 101.3 kPa. The mass is 48.9 grams and the volume is 5.00 cubic centimeters. The student calculates the density of the sample. What is the percent error of the student's calculated density?

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A bubble of air at the bottom of a lake rises to the surface of the lake. Data for the air inside the bubble at the bottom of the lake and at the surface of the lake are listed in the table below.

### Data for the Air Inside the Bubble

Location in Lake	Temperature (K)	Pressure (kPa)	Volume (mL)	Density (g/mL)
surface	293	104.0	2.5	0.0012
bottom	282	618.3	?	—

Determine the mass of air in the bubble at the surface of the lake.

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A sample of an element has a mass of 34.261 grams and a volume of 3.8 cubic centimeters. To which number of significant figures should the density of the sample be expressed?

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