

Concept Review

Section: Avogadro's Number and Molar Conversions

Solve the following problems, and write your answer in the space provided.

1. Determine the number of atoms present in 4.00 mol of aluminum.

2. Determine the number of atoms present in 1.55 mol of sodium.

3. Convert 2.65×10^{25} atoms of fluorine to moles of fluorine atoms.

4. Convert 4.26×10^{25} molecules of hydrogen, H_2 , to moles of hydrogen, H_2 .

5. Convert 1.75×10^{26} atoms of potassium to moles of potassium.

Concept Review *continued*

- 6.** Determine the mass in grams of 7.20 mol of antimony.

- 7.** Determine the mass in grams of 0.500 mol of uranium.

- 8.** Determine the mass in grams of 0.750 mol of francium.

- 9.** A sample of lead has a mass of 150.0 g. What amount of lead in moles does the sample contain?

- 10.** A sample of gold has a mass of 5.00×10^{-3} g. What amount of gold in moles does the sample contain?

Answer Key

Concept Review: Avogadro's Number and Molar Conversions

- 2.41×10^{24} atoms Al
- 9.33×10^{23} atoms Na
- 44.0 mol F
- 70.7 mol H₂
- 291 mol K
- 877 g Sb
- 119 g U
- 167 g Fr
- 0.7239 mol Pb
- 2.54×10^{-5} mol Au

Concept Review: Relative Atomic Mass and Chemical Formulas

- 85.47 amu
- 35.45 amu
- 310.18 g/mol
- 79.88 g/mol
- 84.01 g/mol
- 94.12 g/mol
- 26.04 g/mol
- 18.02 g/mol

Concept Review: Formulas and Percentage Composition

- CdS
- AlF₃
- K₂Cr₂O₇
- CaSO₃
- CaSO₄
- C₆H₆
- C₂H₄O₂
- P₄O₁₀
- B₂H₆
- C₂H₂
- Si = 46.75%, O = 53.25%
- 19.99% C, 26.64% O, 46.65% N, 6.73% H
- 39.99% C, 6.73% H, 53.28%
- (NH₄)₃PO₄ has the greater percentage of nitrogen.
- Sphalerite, ZnS, has the greater percentage of zinc.

Additional Problems

FOUR STEPS FOR SOLVING QUANTITATIVE PROBLEMS

- 0.026 mm
- 3.21 L
- 0.80 g/cm³
- 21.4 g/cm³
- 30 boxes
- 1.73 L
 $0.120 \text{ m} \times 0.120 \text{ m} \times 0.120 \text{ m}$
 - 9.2 g; 5.0 cm³
 - 60.4 kg; $1.88 \times 10^4 \text{ dm}^3$
 - 0.94 g/cm³; $5.3 \times 10^{-4} \text{ m}^3$
 - $2.5 \times 10^3 \text{ kg}$; $2.7 \times 10^6 \text{ cm}^3$
- 2.8 g/cm³
- 0.72 μm
 - 2.5×10^3 atoms
- 1300 L/min
- $1.3 \times 10^6 \text{ cal/h}$
- 5.44 g/cm³
- $2.24 \times 10^4 \text{ cm}^3$
- 32 000 uses
- 2500 L
- 9.5 L/min

MOLE CONCEPT

- $3.7 \times 10^{-4} \text{ mol Pd}$
 - 150 mol Fe
 - 0.040 mol Ta
 - $5.38 \times 10^{-5} \text{ mol Sb}$
 - 41.1 mol Ba
 - $3.51 \times 10^{-8} \text{ mol Mo}$
- 52.10 g Cr
 - $1.5 \times 10^4 \text{ g}$ or 15 kg Al
 - $8.23 \times 10^{-7} \text{ g Ne}$
 - $3 \times 10^2 \text{ g}$ or 0.3 kg Ti
 - 1.1 g Xe
 - $2.28 \times 10^5 \text{ g}$ or 228 kg Li
- 1.02×10^{25} atoms Ge
 - 3.700×10^{23} atoms Cu
 - 1.82×10^{24} atoms Sn
 - 1.2×10^{30} atoms C
 - 1.1×10^{21} atoms Zr
 - 1.943×10^{14} atoms K