

Mole Conversions Mega WS

Directions: Perform each conversion. Show all work, show crossing units out, make sure answer has units. Answers are in parenthesis. Make sure to check your work as you go!!! We will use this worksheet throughout the entire unit. You are not expected to complete it all in one sitting! See School Loop for how much you should do each night.

1) Mole → Mass

Using molar mass of each substance, convert the following quantities.

- | | | | |
|---------------------------------|-----------|--|----------------------------|
| a. 10.0 mol Cr | (520 g) | f. 0.160 mol H ₂ O | (2.88 g) |
| b. 3.32 mol K | (130 g) | g. 5.08 mol Ca(NO ₃) ₂ | (834 g) |
| c. 2.20×10^{-3} mol Sn | (0.261 g) | h. 15.0 mol H ₂ SO ₄ | (1470 g) |
| d. 0.720 mol Be | (6.48 g) | i. 4.52×10^{-5} mol C ₂ H ₄ | (1.27×10^{-3} g) |
| e. 2.40 mol N ₂ | (67.2 g) | j. 0.0112 mol K ₂ CO ₃ | (1.55 g) |

2) Mass → Mole

Using molar mass of each substance convert the following quantities.

- | | | | |
|-------------------------------|------------------------------|--|-------------------------------|
| a. 72.0 g Ar | (1.80 mol) | f. 27.4 g NO ₂ | (0.596 mol) |
| b. 3.70×10^{-1} g B | (3.43×10^{-2} mol) | g. 5.00 g H ₂ | (2.50 mol) |
| c. 187 g Al | (6.93 mol) | h. 2.64×10^{-4} g Li ₃ PO ₄ | (2.28×10^{-6} mol) |
| d. 333 g SnF ₂ | (2.13 mol) | i. 11.0 g CH ₄ | (0.688 mol) |
| e. 7.21×10^{-2} g He | (1.80×10^{-2} mol) | j. 847 g (NH ₄) ₂ CO ₃ | (8.82 mol) |

3) What is the volume of the following gases?

Using molar volume, convert the following quantities.

- 5.40 mol O₂ (121 L)
- 3.20×10^{-2} mol CO₂ (0.717 L)
- 0.960 mol SO₃ (21.5 L)

4) How many moles are in each of the following volumes?

Using molar volume, convert the following quantities.

- 89.6 L Ne (4.00 mol)
- 1.00×10^3 L C₂H₆ (44.6 mol)
- 5.42×10^{-1} L F₂ (2.42×10^{-2} mol)

5) Find the number of moles in each of the number of representative particles.

Using Avogadro's Number, convert the following quantities.

- 1.20×10^{25} atoms of P (19.9 mol)
- 3.87×10^{21} molecules of AlF₃ (6.43×10^{-3} mol)
- 4.81×10^{14} molecules of NH₃ (7.99×10^{-10} mol)

6) How many representative particles are in each of the following mole quantities?

Using Avogadro's Number, convert the following quantities.

- 1.24 mol Cl₂ (7.46×10^{23} molecules)
- 4.20×10^{-3} mol K₂S (2.53×10^{21} molecules)
- 34.02 mol Ca(OH)₂ (2.048×10^{25} molecules)

7) Convert the following two-step quantities, converting first to moles and then to the desired quantity.

- Find the number of molecules in 60.0 g of N₂O. (8.21×10^{23} molecules)
- Find the volume of 3.24×10^{22} molecules of Ne (1.21 L)
- Find the mass of 18.0 L of CH₄ (12.9 g)
- Find the volume of 835 g of SO₃ (234 L)
- Find the mass of one atom of nickel. (1×10^{-22} g)

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