Exercise 3.3d

Mole-Particle Conversions

Name: _____

Date: _____ Per: _____

In this class the number of particles present in exactly 12.000 g of ^{12}C will be estimated as 6.022×10^{23}. This amount is referred to as Avogadro's number (N_A). This is the number of particles present in 1 mole of a substance.

One Step: Mole → Particle Conversions

$$\frac{\textbf{mol X}}{} \left| \frac{\textbf{6.022 x } \mathbf{10^{23}} \textbf{ p. X}}{\textbf{1 mol X}} \right. = \textbf{p. X}$$

One Step: Particle → Mole Conversions

$$\frac{\textbf{p. X}}{} \left| \frac{\textbf{1 mol X}}{\textbf{6.022 x } \mathbf{10^{23}} \textbf{ p. X}} \right. = \textbf{mol X}$$

DIRECTIONS: Calculate the number of atoms in:

1. 1.26 mol potassium
2. 0.3500 mol lithium
3. 2.00 mol sulfur
4. 5.00 mol magnesium
5. 1.4×10^{-13} mol gold
6. 3.154×10^{-3} mol aluminum
7. 8.5001×10^{3} mol cadmium
8. 0.0250 mol manganese
9. 0.00010 mol calcium
10. 0.010 mol potassium

DIRECTIONS: Calculate the number of moles in:

11. 3.0010×10^{24} atoms helium
12. 1.01×10^{26} atoms copper
13. 7.80×10^{29} atoms silver
14. 1.38×10^{19} atoms silicon
15. 2.02×10^{23} atoms argon
16. 5.0×10^{21} atoms nickel
17. 2.6700×10^{20} atoms iron
18. 2.10×10^{25} atoms titanium
19. 8.54×10^{23} atoms mercury
20. $1. \times 10^{16}$ atoms vanadium

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Answers: 1) 7.58×10^{23} p. 2) 2.108×10^{23} p. 3) 1.20×10^{24} p. 4) 3.01×10^{24} p. 5) 8.4×10^{10} p. 6) 1.899×10^{21} p. 7) 5.1188×10^{27} p. 8) 1.5055×10^{22} p. 9) 6.0×10^{19} p. 10) 6.0×10^{21} p. 11) 4.9834 mol 12) 166.2 mol 13) 1.30×10^{6} mol 14) 2.29×10^{-5} mol 15) 0.335 mol 16) 0.0083 mol 17) 4.434×10^{-4} mol 18) 34.9 mol 19) 1.42 mol 20) 2×10^{-8} mol