

1. What is a mole?
2. How many things are there in a mole?
3. Why is the answer for #2 such a big number?
4. Draw out the "mole conversion diagram" in the space to the right:

5. Complete the following tables. Show your work to the side.

moles	atoms
2.5 mol Ag	1.505 x 10 ²⁴ atoms
0.25 mol C	1.505 x 10 ²³ atoms
7475.08 mol Ag	4.5 x 10 ²⁷ Ag atoms

atoms	grams
4.2 x 10 ¹⁸ Pb atoms	0.00145 g Pb
6.02 x 10 ²⁴ atoms	40 g He
3.93 x 10 ²⁴ atoms	150 g Na

moles	volume
10 moles CO ₂	224 L CO ₂
2.23 moles Ar	50 L Ar
0.2 moles CH ₄	4.48 L CH ₄

molecules	grams
2.5 x 10 ¹⁸ mlc H ₂ O	7.47 x 10 ⁻⁵ grams
7.52 x 10 ²³ mlc CO ₂	55 g CO ₂
2.4 x 10 ²⁴ mlc NaOH	160 g NaOH

volume	grams
2.5 L He	0.446 g He
2.5 L O ₂	3.57 g O ₂
2.5 L O ₃	5.36 g O ₃

Fill in the tables below. Show your work for each on a separate sheet of paper!

I. Pure Substances

	Mass	Moles	# of atoms
1	130 g zinc	1.988 moles Zn	1.197×10^{24} atoms of Zn
2	12 g C	1 mole C	6.02×10^{23} atoms of carbon
3	4.5g H	4.5 moles hydrogen	2.709×10^{24} atoms of H
4	35.5 g silver	0.329 moles silver	1.98×10^{23} atoms of Ag
5	3.5g N	0.25 moles nitrogen	1.505×10^{23} atoms of N
6	5148.96 g Fe	92.19 moles iron	5.55×10^{25} atoms of iron
7	500 g Neon	24.78 moles Ne	1.49×10^{25} atoms of Ne

II. Molecules

	Mass	Moles	# of molecules	# of Oxygen atoms
1	20.0 g CO ₂	0.45 moles	2.736×10^{23}	5.47×10^{23}
2	.021g O ₂	5.8×10^4 moles	3.5×10^{20} molecules O ₂	7.0×10^{20}
3	68 g AgNO ₃	0.4 moles AgNO ₃	2.408×10^{23}	7.224×10^{23}
4	3.7 g CuSO ₄	.023 moles CoSo ₄	1.396×10^{22}	5.586×10^{22}
5	332.22 g	3.322 moles	2.0×10^{24} molecules CaCO ₃	6.0×10^{24}
6	144 g	4.8 moles NO	2.889×10^{24} molecules	2.889×10^{24}
7	55 g H ₂ O	3.056 moles H ₂ O	1.839×10^{24} molecules	1.839×10^{24}