

(#6-1)
 Mathematical Relationships
 Mole #1

****MAINTAIN CORRECT SIGNIFICANT FIGURES****

1 mole = 6.022E 23 things

Convert the following to moles.

1. 3.011 E 23 molecules of Hydrogen gas = _____

4 sig fig → $3.011E23 \text{ molecules} \cdot \frac{1 \text{ mol}}{6.022E23 \text{ molecules}} = 0.5000 \text{ moles } H_2$

2. 9.9 E24 molecules NaNO₃ = _____

2 sig fig → $9.9E24 \text{ molecules} \cdot \frac{1 \text{ mol}}{6.022E23} = 16. \text{ moles } NaNO_3$

3. 2.99000 E22 ions of OH⁻ = _____

6 sig fig → $2.99000E22 \cdot \frac{1}{6.022E23} = 0.04965 \text{ ions } OH^-$ (4 sig fig)

Convert the following from moles to number of particles

4. 2.5 moles Oxygen gas = _____

2 sig fig → $2.5 \text{ moles} \cdot \frac{6.022E23}{1 \text{ mol}} = 1.5E24 \text{ } O_2$

5. 0.111 mol sodium hydroxide

3 sig fig → $0.111 \text{ mol} \cdot \frac{6.022E23}{1 \text{ mol}} = 6.68E22 \text{ } NaOH$

6. 2.20 moles lithium ions

3 sig fig → $2.20 \text{ mol} \cdot \frac{6.022E23}{1 \text{ mol}} = 1.32E24 \text{ } Li \text{ ions}$

Mix it up!

7. 0.15 moles O₂ to molecules

2 sig fig → $0.15 \text{ mol} \cdot \frac{6.022E23}{1 \text{ mol}} = 9.0E22 \text{ } O_2$

8. 1.50 E23 N₂ to moles

3 sig fig → $1.50E23 \cdot \frac{1 \text{ mole}}{6.022E23} = 0.249 \text{ mol } N_2$

9. 100.0 moles of water to molecules

4 sig fig → $100.0 \text{ mol} \cdot \frac{6.022E23}{1 \text{ mol}} = 6.022E25 \text{ } H_2O$

10. 250 molecules to moles.

2 sig fig → $250 \text{ molecules} \cdot \frac{1 \text{ mol}}{6.022E23} = 4.2E-22$