

The mole is a unit of measurement used in chemistry to express amounts of a chemical substance, defined as an amount of a substance that contains as many elementary entities (e.g., atoms, molecules, ions, electrons) as there are atoms in 12 grams of pure carbon-12 (^{12}C), the isotope of carbon with atomic weight 12. This corresponds to a value of $6.02214179(30) \times 10^{23}$ elementary entities of the substance. It is one of the base units in the International System of Units, and has the unit symbol mole.

1 mole of phosphorous (P_4) contains $6.02214179(30) \times 10^{23}$ molecules of P_4 . Each molecule of P_4 contains 4 atoms of phosphorous (P). Then 1 mole of phosphorous (P_4) contains

$$6.02 \times 10^{23} \cdot 4 = 24.08 \times 10^{23} \text{ atoms}$$

Then 1.20×10^{25} atoms of phosphorous (P) are

$$\frac{1.20 \times 10^{25}}{24.08 \times 10^{23}} = 5 \text{ moles of } \text{P}_4$$

Answer: 5 moles of P_4 or 20 moles of P.