CONCEPT: ROOT MEAN SQUARE SPEED

- **The Root Mean Square Speed** (v_{rms}) formula is used to determine the velocity of _____ type(s) of gas molecules.

Root Mean Square Speed

Root Mean Square Speed Formula

$$v_{rms} = \frac{3RT}{M}$$

☐ M = Molar mass of the gas in _____.

☐ R = Gas constant of the gas in $8.314 \frac{J}{mol \cdot K}$.

☐ T = Temperature of the gas in ___Kelvin___.

EXAMPLE: Calculate the *rms* speed of NH_3 molecules at 50 ºC.

PRACTICE: Determine which gas would have a root mean square speed of 515.59 m/s at 405 K.

a) Cl_2 b) CO_2 c) F_2 d) NH_3 e) CH_4

PRACTICE: The root mean square speed of gas molecules is 283.0 m/s at a given temperature *T* when the recorded molar mass is 42.0 g/mol. What would be the root mean square speed for a gas with a molar mass of 152.0 g/mol?