

Answer on Question #45023 – Chemistry – Inorganic Chemistry

Question

Briefly describe the three assumptions on which the ideal gas law, or kinetic-molecular theory, is based.

Answer

The main three assumptions are as follows:

1. The gas consists of very small particles known as molecules, which are in continuous, rapid, random motion. (The smallness of molecules size is such that the total volume of the individual gas molecules added up is negligible compared to the volume of the smallest open ball containing all the molecules).
2. Collisions between gas particles and between particles and container walls are elastic collisions. (This means, the molecules are considered to be perfectly spherical in shape, and elastic in nature, i.e. there is no loss of kinetic energy in the collisions. If collisions are considered to be perfectly elastic, this means the molecules exert no forces on one another).
3. The average kinetic energy of the gas particles depends only on the absolute temperature of the system. (This means that what we experience as heat is simply the kinetic energy of gas particles motion).