**Kinetic Molecular Theory of Gases Practice Fun!**

Answer the following questions about your favorite kinetic molecular theory:

1) If gas molecules can travel so quickly (air molecules can move around half a kilometer per second), why do they only move across the room at a very slow speed (around half a kilometer in seven *hours*?) Explain, using your knowledge of how gas molecules behave.

2) In what ways do the molecules of an ideal gas differ from those of a real gas? Do you think this causes real gases to behave significantly different than ideal gases?

3) When placed together, all gases mix with one another. This is far different than liquids, where some won’t mix at all (such as oil and water). Why are gas molecules able to mix together when liquids cannot?

4) Physicists have a concept referred to as that of an “ideal fluid”, which is a hypothetical liquid with simplified characteristics, just as an ideal gas has certain simplified characteristics. However, unlike an ideal gas, ideal fluids do a poor job of explaining the behavior of liquids. Give one possible reason that the concept of ideal fluids is so much less successful than that of ideal gases.

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**ANSWERS**

Answer the following questions about your favorite kinetic molecular theory:

1) If gas molecules can travel so quickly (air molecules can move around half a kilometer per second), why do they only move across the room at a very slow speed (around half a kilometer in seven *hours*?) Explain, using your knowledge of how gas molecules behave.

**Though gas molecules actually move at about half a kilometer per second, they spend most of this time bouncing off of each other, which causes them to stay mostly in the same place. As a result of these collisions the apparent velocity of gas molecules is much lower than their actual velocities.**

2) In what ways do the molecules of an ideal gas differ from those of a real gas? Do you think this causes real gases to behave significantly different than ideal gases?

* + **Real gas molecules are not infinitely small**
  + **Real gas molecules do not undergo elastic collisions**
  + **Real gas molecules experience intermolecular forces**

**Together, these properties don’t really cause real gases to behave very differently from ideal gases, as the molecules are very small, have little time to experience intermolecular forces, and energy is added that keeps the molecules moving in a way that appears to cause elastic collisions.**

3) When placed together, all gases mix with one another. This is far different than liquids, where some won’t mix at all (such as oil and water). Why are gas molecules able to mix together when liquids cannot?

**Gas molecules mix with each other because there are no intermolecular forces that allow the molecules to repel each other.**

4) Physicists have a concept referred to as that of an “ideal fluid”, which is a hypothetical liquid with simplified characteristics, just as an ideal gas has certain simplified characteristics. However, unlike an ideal gas, ideal fluids do a poor job of explaining the behavior of liquids. Give one possible reason that the concept of ideal fluids is so much less successful than that of ideal gases.

**The molecules in liquids are really close to one another and have a lot of strong interactions. This is much different than the concept of ideal gases, where the molecules are so far apart that they essentially don’t interact with each other.**