Day 6.1 Warm-Up

1. Relatively slow rates of chemical reaction are associated with which of the following?

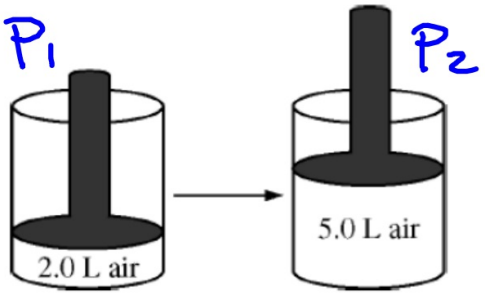
   (A) The presence of a catalyst
   (B) High temperature
   (C) High concentration of reactants
   (D) Strong bonds in reactant molecules
   (E) Low activation energy

2. Which of the following lists the substances F_2, HCl, and HF in order of increasing boiling point?

   (A) HF < HCl < F_2
   (B) HF < F_2 < HCl
   (C) HCl < F_2 < HF
   (D) HCl < HF < F_2
   (E) F_2 < HCl < HF

3. At 298 K and 1 atm, bromine is a liquid with a high vapor pressure, whereas chlorine is a gas. This provides evidence that, under these conditions, the

   (A) forces among Br_2 molecules are greater than those among Cl_2 molecules
   (B) forces among Br_2 molecules are weaker than the Br-Br bond
   (C) forces among Cl_2 molecules are stronger than the Cl-Cl bond
   (D) Br-Br bond is stronger than the Cl-Cl bond
   (E) Br-Br bond is weaker than the Cl-Cl bond



4. The volume of a sample of air in a cylinder with a movable piston is 2.0 L at a pressure P_1, as shown in the diagram above. The volume is increased to 5.0 L as the temperature is held constant. The pressure of the air in the cylinder is now P_2. What effect do the volume and pressure changes have on the average kinetic energy of the molecules in the sample?

   (A) The average kinetic energy increases.
   (B) The average kinetic energy decreases.
   (C) The average kinetic energy stays the same.
   (D) It cannot be determined how the kinetic energy is affected without knowing P_1 and P_2.