

2002 AP[®] CHEMISTRY FREE-RESPONSE QUESTIONS (Form B)

6. Using principles of chemical bonding and molecular geometry, explain each of the following observations. Lewis electron-dot diagrams and sketches of molecules may be helpful as part of your explanations. For each observation, your answer must include references to both substances.
- (a) The bonds in nitrite ion, NO_2^- , are shorter than the bonds in nitrate ion, NO_3^- .
 - (b) The CH_2F_2 molecule is polar, whereas the CF_4 molecule is not.
 - (c) The atoms in a C_2H_4 molecule are located in a single plane, whereas those in a C_2H_6 molecule are not.
 - (d) The shape of a PF_5 molecule differs from that of an IF_5 molecule.
 - (e) HClO_3 is a stronger acid than HClO .