

2004 AP[®] CHEMISTRY FREE-RESPONSE QUESTIONS

Answer EITHER Question 7 below OR Question 8 printed on page 13. Only one of these two questions will be graded. If you start both questions, be sure to cross out the question you do not want graded. The Section II score weighting for the question you choose is 15 percent.

7. Use appropriate chemical principles to account for each of the following observations. In each part, your response must include specific information about both substances.
- (a) At 25°C and 1 atm, F_2 is a gas, whereas I_2 is a solid.
 - (b) The melting point of NaF is 993°C, whereas the melting point of $CsCl$ is 645°C.
 - (c) The shape of the ICl_4^- ion is square planar, whereas the shape of the BF_4^- ion is tetrahedral.
 - (d) Ammonia, NH_3 , is very soluble in water, whereas phosphine, PH_3 , is only moderately soluble in water.