

2003 AP[®] CHEMISTRY FREE-RESPONSE QUESTIONS

6. For each of the following, use appropriate chemical principles to explain the observation. Include chemical equations as appropriate.
- (a) In areas affected by acid rain, statues and structures made of limestone (calcium carbonate) often show signs of considerable deterioration.
 - (b) When table salt (NaCl) and sugar ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) are dissolved in water, it is observed that
 - (i) both solutions have higher boiling points than pure water, and
 - (ii) the boiling point of $0.10\text{ M NaCl}(aq)$ is higher than that of $0.10\text{ M C}_{12}\text{H}_{22}\text{O}_{11}(aq)$.
 - (c) Methane gas does not behave as an ideal gas at low temperatures and high pressures.
 - (d) Water droplets form on the outside of a beaker containing an ice bath.