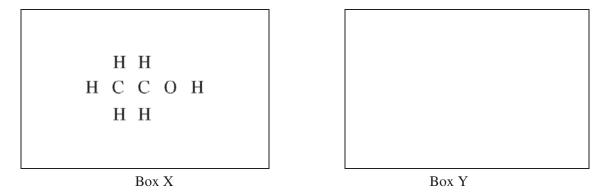
2013 AP® CHEMISTRY FREE-RESPONSE QUESTIONS

6. Answer the following questions using principles of molecular structure and intermolecular forces.

Compound	Empirical Formula	Solubility in Water	Boiling Point (°C)
1	C ₂ H ₆ O	Slightly soluble	-24
2	C ₂ H ₆ O	Soluble	78

Compounds 1 and 2 in the data table above have the same empirical formula, but they have different physical properties.

- (a) The skeletal structure for one of the two compounds is shown below in Box X.
 - (i) Complete the Lewis electron-dot diagram of the molecule in Box X. Include any lone (nonbonding) pairs of electrons.



- (ii) In Box Y above, draw the complete Lewis electron-dot diagram for the other compound, which is a structural isomer of the compound represented in Box X. Include any lone (nonbonding) pairs of electrons.
- (b) On the basis of the complete Lewis electron-dot diagrams you drew in part (a) and the information in the data table above, identify which compound, 1 or 2, has the structure represented in Box X. Justify your answer in terms of the intermolecular forces present in each compound.