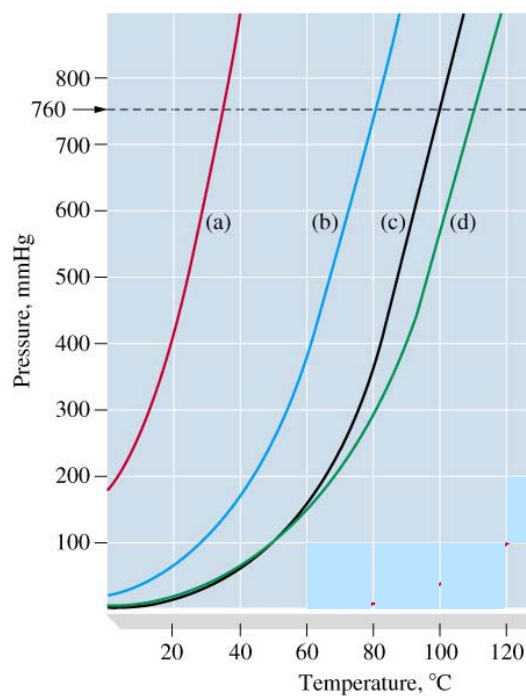




2. (16 pts) Use the vapor pressure diagram of substances (a) through (d) to answer the following questions.

a. (4 pts) Which of the substances is most likely to have the strongest intermolecular forces? Give a brief, 1-2 sentence explanation for your choice.

b. (4 pts) Which of the substances has the lowest normal boiling point? What is its approximate value?



c. (8 pts) Substances (a) and (b) represent different isomers with the formula  $C_2H_6O$ . Draw the Lewis structure for substances (a) and (b) in the space below, and briefly explain, in 1-2 sentences, how you know which substance is which.

Substance (a)

Substance (b)

Explanation:

1. (16 pts) Consider three identical flasks, each filled with a sample of a different gas.
- (6 pts) Draw a Lewis structure of each of the substances. Then, list all the intermolecular forces present in each sample.

Lewis structure

Intermolecular force(s)

Carbon dioxide

Iodine

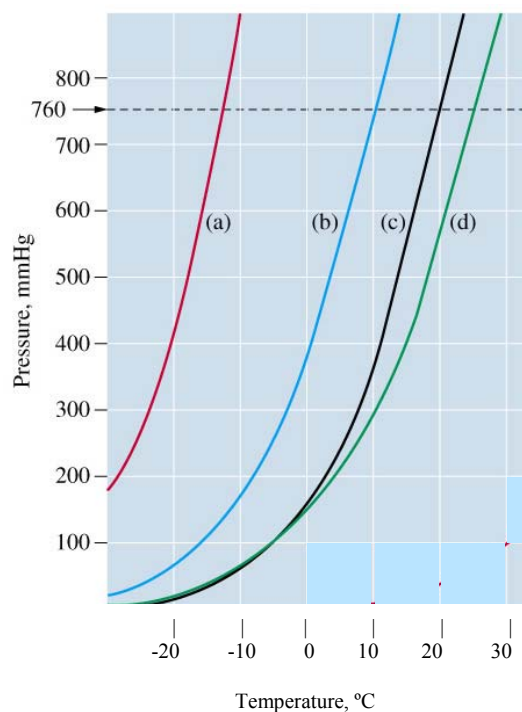
Propane

- (4 pts) If all samples have the same average molecular speed, in which flask(s) will the molecules have the lowest average kinetic energy? Briefly explain in 1-2 sentences.
- (3 pts) In order for all samples to have the same average molecular speed, what condition(s) of the sample(s) must be different? For which sample(s)? Briefly explain in 1-2 sentences.
- (3 pts) Which sample would be most easily identified visually? Briefly explain in 1-2 sentences.

2. (16 pts) Use the vapor pressure diagram of substances (a) through (d) to answer the following questions.

a. (4 pts) Which of the substances is most likely to have the weakest intermolecular forces? Give a brief, 1-2 sentence explanation for your choice.

b. (4 pts) Which of the substances has the greatest normal boiling point? What is its approximate value?



c. (8 pts) Substances (a) and (b) represent different isomers with the formula  $C_4H_{10}$ . Draw the Lewis structure for substances (a) and (b) in the space below, and briefly explain, in 1-2 sentences, how you know which substance is which.

Substance (a)

Substance (b)

Explanation: