

## Question 5: Short Answer

4 points

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**A** For the correct answer: **Point 01**
*Tetrahedral*


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**B** For the correct answer and a valid justification: **Point 02**

*Agree. Compound Y has a larger, more polarizable electron cloud because the Si atom has more occupied electron shells than the C atom, giving compound Y stronger London dispersion forces and a higher boiling point than compound X.*

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**C** For the correct answer and a valid justification. **Point 03**

Examples of acceptable responses may include the following:

- Compound X. Compound X has weaker intermolecular forces than compound Y, so molecules of X are more likely to be in the gas phase at 82°C and would therefore have a higher vapor pressure.*
- Compound X. At 82°C, compound X has reached its boiling point, but compound Y has not. Therefore, the proportion of X molecules in the vapor phase would be much greater than that of compound Y, giving compound X the higher vapor pressure.*

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**D** For the correct calculated value: **Point 04**

$$PV = nRT$$

$$n = \frac{PV}{RT} = \frac{(2.30 \text{ atm})(12.5 \text{ L})}{(0.08206 \frac{\text{L} \cdot \text{atm}}{\text{K} \cdot \text{mol}})(471 \text{ K})} = 0.744 \text{ mol}$$


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