

16.E: Exercises

Chemical Principles (Zumdahl and Decoste)
Textmap Alternative

- For each of the following pairs of substances, specify the type of interparticle bonding in each, and indicate which one has the higher boiling point:
 - NH_3 or PH_3
 - C_4H_{10} or C_6H_{14}
 - CO_2 or H_2O
 - HCl or LiCl
 - Na or NaCl
- For each of the following types of solids, describe its structure and the nature of the forces holding it together, and give the formula of at least one example:
 - ionic
 - covalent (molecular)
 - metallic
 - network covalent
- List the substance types in (3) in order of increasing melting point.
- Which of the types of substances in (3) conduct electricity as solids? as liquids?
- Of the following substances: NaCl , diamond, Fe , F_2 , $\text{C}_3\text{H}_7\text{OH}$, which one
 - has the lowest boiling point?
 - is held together by ionic bonds?
- Define boiling point, critical temperature, critical pressure, and triple point.
- Explain how each of the following affects the vapor pressure of a liquid:
 - surface area
 - temperature
 - intermolecular attractive forces
 - volume of liquid
- What are the three types of intermolecular attractive forces and list them in order of increasing strength?
- The normal (1 atm) melting and boiling points of O_2 are -218°C and -183°C , respectively. Its triple point is at -219°C and 1.14×10^{-3} atm, and its critical point is at -119°C and 49.8 atm.
 - Sketch the phase diagram for O_2 , showing the 4 points given above and indicating the area in which each phase is stable.
 - Which is denser, $\text{O}_2(\text{s})$ or $\text{O}_2(\text{l})$? Explain.
 - As it is heated, will solid O_2 sublime or melt at a pressure of 1 atm?
- The vapor pressure of solid iodine (I_2) at 30°C is 0.466 mm Hg. How many milligrams of iodine will sublime into an evacuated 1.00-liter flask?

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