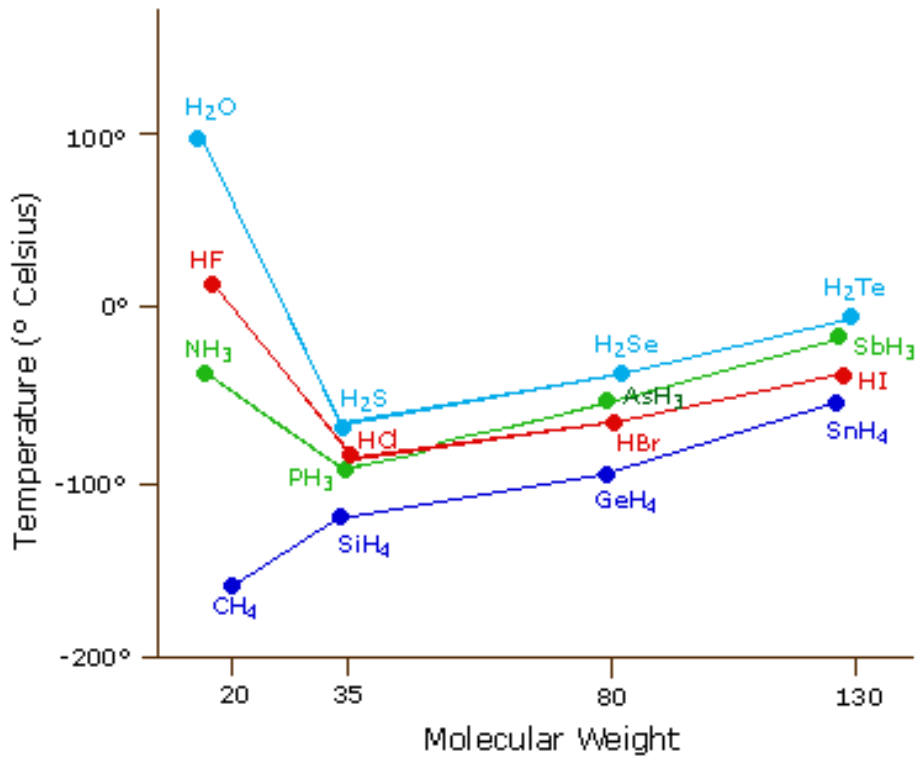
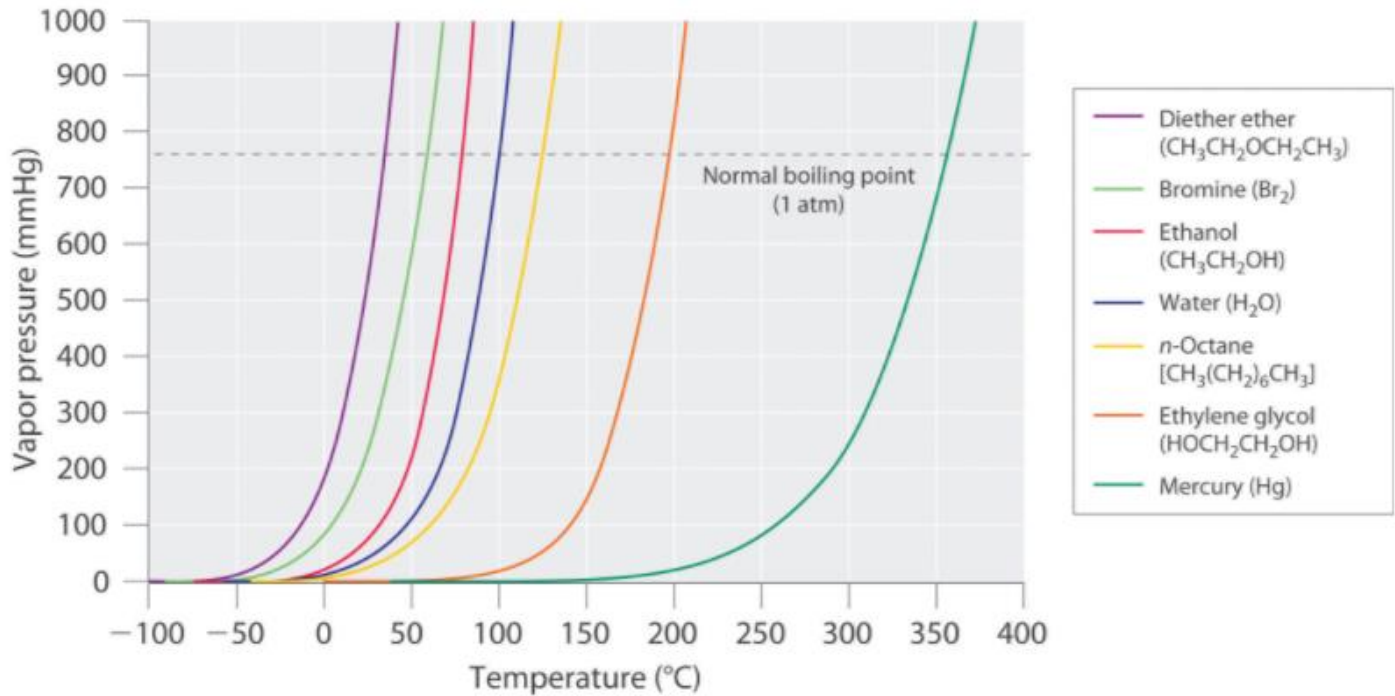


Boiling Points of Hydrides



Vapor Pressure of Various Liquids



Place	Altitude above Sea Level (ft)	Atmospheric Pressure (mmHg)	Boiling Point of Water (°C)
Mt. Everest, Nepal/Tibet	29,028	240	70
Bogota, Colombia	11,490	495	88
Denver, Colorado	5280	633	95
Washington, DC	25	759	100
Dead Sea, Israel/Jordan	-1312	799	101.4

Condensed State of Matter; Solids and Liquids

Intermolecular Attractions.

Intramolecular Attractions: chemical bonds within the atom. Review types of bonds: Ionic, polar covalent, ionic.

Very strong forces of attraction.

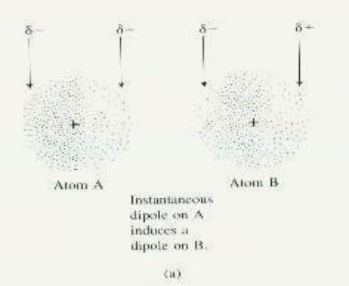
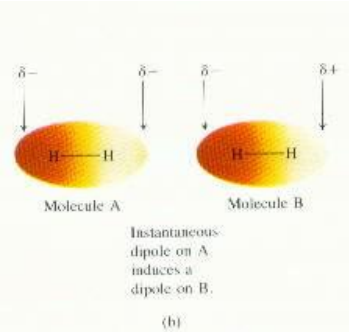
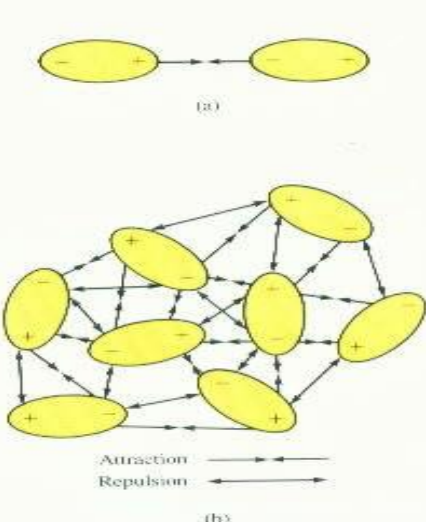
Remain intact during phase change

Intermolecular Attractions:

Significant at short range distances (unlike gases). Low temperatures or high pressures

Are overcome in physical phase changes

Review molecular geometry and polarity.

Type and strength comparison to covalent bonds.	Non-Polar (~1%)	Polar (~5%)(dipole moment)	H-bonding (~10%) Strongest bonding between neutral molecules.	Ionic
Examples	SO ₃ , CH ₄ , H ₂	SF ₂ , SO ₂ , HCl	NH ₃ , H ₂ O, HF	NaCl, MgBr ₂
Type of IA	LDF (London Dispersion Forces), van-der Waals	Dipole-Dipole	H-bonding	Electrostatic attraction
Illustration and Description	Temporary induced dipole. Larger atoms with more electrons have greater LDFs. 	Attraction due to charge distribution	~1% strong as covalent bond. H bonded to highly electronegative atoms N,O, or F	Strong 3-D lattice network
		 Figure 10.2 (a) The electrostatic interaction of two polar molecules. (b) The interaction of many dipoles in a condensed state.		
General	Oil, fat, alkanes, gases at RT	Water, alcohol, liquid or solid at RT		Salts
Properties				
F.P./ B.P.	Low		High	
Vapor Pressure	High		Low	
ΔH fusion/vaporization	Low		High	
Surface Tension	Low	(liquid state only)	High	
Viscosity	Low	(liquid state only)	High	

Chapter 10, Condensed State.

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