Name:_____ **Nonbonding Forces**

Network Covalent

Allotrops of Carbon

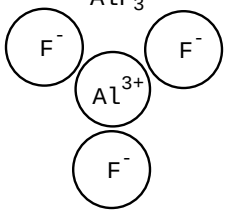
DIAMOND
Mp 3500°C
Bp 6400°C

Graphite
Mp 3000°C
Bp 6000°C

Ionic

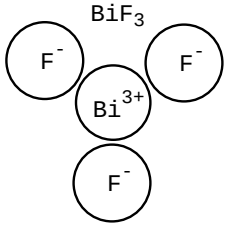
NaCl
Mp 801°C
Bp 1413 °C

AlF_3



Mp 1291°C

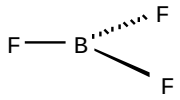
BiF_3



Mp 649°C

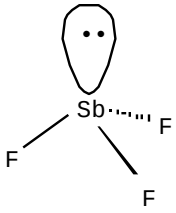
Molecules

BF_3



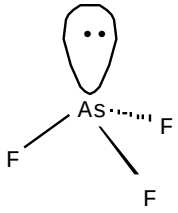
Mp -127°C
Bp -100°C

SbF_3



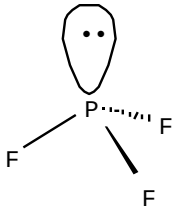
Mp 292°C
Bp 376°C

AsF_3



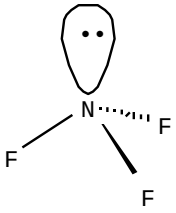
Mp -8.5°C
Bp 60.5°C

PF_3



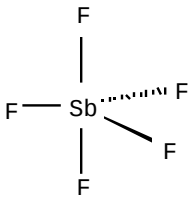
Mp -152°C
Bp -102°C

NF_3



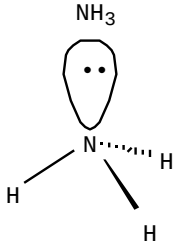
Mp -207°C
Bp -129°C

SbF_5



Mp 8°C
Bp 150°C

NH_3



Mp -78°C
Bp -33°C

Circle ammonia. Draw another ammonia molecule & show the hydrogen bonding between them.

For video help, http://homework.sdmesa.edu/dgergens/chem100/polarity_nonmolecules/index.html (click here)

Using the data given on the left:

Circle the substance type which is highest boiling.

network covalent **ionic** **molecular**

Circle the substance type which is highest melting.

network covalent **ionic** **molecular**

Circle the substance type which is lowest boiling.

network covalent **ionic** **molecular**

Circle the substance type which is lowest melting.

network covalent **ionic** **molecular**

Circle the highest melting, **AlF_3** **BF_3**, and explain your reasoning.

Match the geometry for each

SbF_3 AsF_3 PF_3 NF_3 BF_3

linear **bent** **pyramidal** **trigonal planar** **tetrahedral**

Match the predominant physical attractive force observed between molecules of

SbF_3 AsF_3 PF_3 NF_3 BF_3

hydrogen bonding **dipole-dipole** **dispersion**

Insert SbF_5 & NH_3 into the bp ranking below:

SbF_3 AsF_3 BF_3 PF_3 NF_3

Explain why NH_3 is higher boiling than NF_3

Match the predominant physical attractive force observed between molecules of

SbF_5 NH_3

hydrogen bonding **dipole-dipole** **dispersion**

Circle the substance that is nonpolar

SbF_5 NH_3

Explain why SbF_5 is higher boiling than NH_3

Define allotrope and give examples.