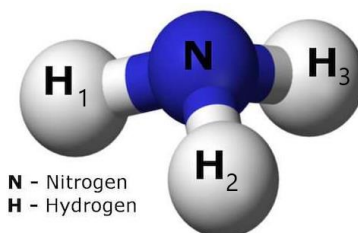
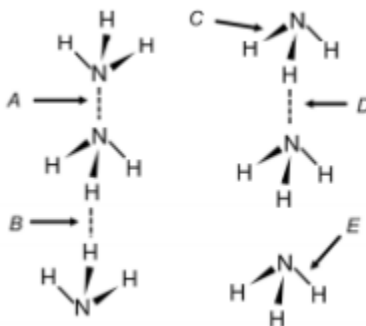


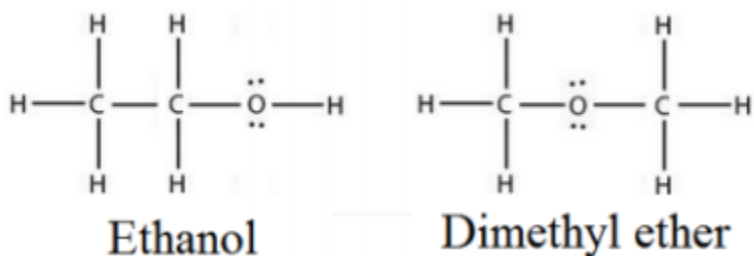
- What determines whether a substance is a liquid at room temperature?
 - The number and types of intramolecular bonds.
 - The intermolecular forces of attraction.
 - The density of the substance is less when it is in its liquid state.
 - The amount of electrons that are present in the substance.
- Which of the following is the most polar bond listed?
 - H-H
 - C-H
 - F-F
 - H-F



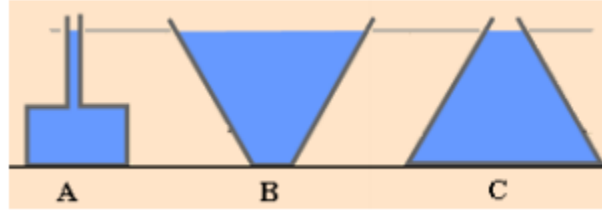
- In the ammonia molecule shown above, which element would have the negative dipole moment?
 - N
 - H₁
 - H₂
 - H₃



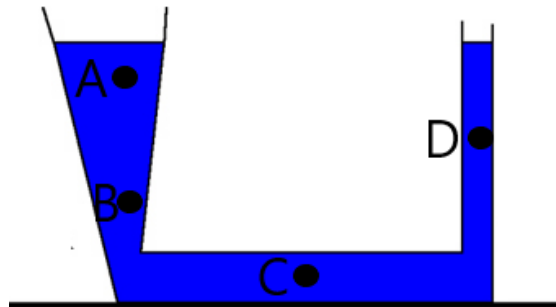
- In the diagram above, which of the following arrows identifies the hydrogen bonding in ammonia?
 - A
 - B
 - C
 - D
 - E
- Which of the following molecules would be expected to form hydrogen bonding attractions?
 - CH₄
 - CH₃CH₂OH
 - HCl
 - CH₃OCH₃



- 6) Which substance shown above would have the highest boiling point and why?
- (A) Ethanol, due to its London dispersion forces.
 (B) Ethanol, due to its hydrogen bonding.
 (C) Dimethyl ether, due to its London dispersion forces.
 (D) Dimethyl ether, due to its hydrogen bonding.
- 7) Which substance below would have dipole to dipole forces of attraction?
- (A) NH_3
 (B) CO_2
 (C) F_2
 (D) HCl
- 8) Which substance below would be the most soluble in water?
- (A) PH_3
 (B) C_6H_6
 (C) CH_3COOH
 (D) Br_2
- 9) Which intermolecular force do all molecular substances have?
- (A) Hydrogen Bonding
 (B) Dipole-to-Dipole
 (C) London Dispersion Forces
 (D) Covalent Network
- 10) All of the substances below contain London Dispersion Forces. Which of the following substances would have the highest boiling point due to having the most London Dispersion Forces?
- (A) CH_4
 (B) C_2H_6
 (C) C_3H_8
 (D) C_4H_{10}



- 11) Rank the containers above from the greatest to the least pressure that the bottom of the container experiences given that all containers are filled with liquid water.
- (A) $A > B > C$
 (B) $C > A > B$
 (C) $B > A > C$
 (D) $A = B = C$
- 12) If you are fully submerged at a depth of 2.5 m in a freshwater lake (density = 1000 kg/m^3), what pressure do you experience?
- (A) 400 Pa
 (B) 2500 Pa
 (C) 25000 Pa
 (D) 1002.5 Pa
- 13) The gauge pressure of an object in saltwater (density = 1025 kg/m^3) is 184500 Pa. What depth is the object at in the saltwater?
- (A) 18 m
 (B) 25 m
 (C) 33 m
 (D) 180 m



- 14) Which point in the picture above would experience the greatest pressure?
- (A) Point A
 (B) Point B
 (C) Point C
 (D) Point D

- 15) What is the buoyant force on a 0.8 m^3 copper cube that is fully submerged in saltwater (density of 1025 kg/m^3)?
(A) 128.1 N
(B) 820 N
(C) 1281 N
(D) 8200 N
- 16) A solid object is hung from a spring scale and measured to weight 15 N when outside the water. When the object is completely submerged in water the object only weighs 12 N. What is the buoyant force on the object?
(A) 0.8 N
(B) 1.25 N
(C) 3 N
(D) 27 N
- 17) Another solid object is hung from a spring scale and measured to weigh 8 N when outside the water. When the object is completely submerged in the water, the object only weights 6 N. What is the volume of the object if the density of water is 1000 kg/m^3 ?
(A) 0.0001 m^3
(B) 0.0002 m^3
(C) 0.0003 m^3
(D) 0.0004 m^3
- 18) What water source makes up the greatest percentage of the hydrosphere?
(A) Oceans
(B) Glaciers
(C) Groundwater
(D) Soil Moisture
- 19) Water gets into the atmosphere predominately by evaporation and transpiration. How does evaporation and transpiration differ?
(A) Evaporation is the vaporizing of water from oceans or lakes, whereas transpiration is the evaporation of water from plants.
(B) Evaporation is the vaporizing of water from the ground, whereas transpiration is the evaporation of water from oceans or lakes.
(C) Evaporation is the vaporizing of water each day, whereas transpiration is the evaporation of water over a yearly basis.
(D) Evaporation is the vaporizing of water from pools, whereas transpiration is the evaporation of water from public transit systems.
- 20) What common laboratory technique in chemistry is performed by the hydrologic cycle?
(A) Chromatography
(B) Filtration
(C) Titration
(D) Distillation