

CH3OS

Phys. Prop. & Change

① Ice Melting - Physical b/c it is reversible, & molecules are not permanently changed
Iron Rusting - Chemical b/c Chemical properties have changed.

② a) malleable b) shiny c) ductile d) Conductive

③ a) Solid b) Solid c) liq d) liq e) gas f) gas

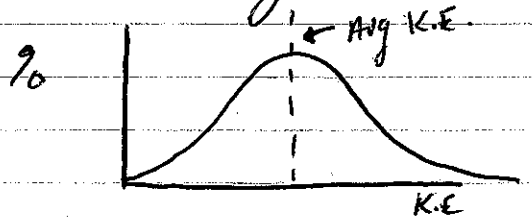
④ ① gas → d & b ② liq → a, b, c, d ③ solid → a, c

⑤ a) phys b) Chem c) chem d) phys



⑦ S.T.P. = STANDARD TEMPERATURE & PRESSURE
ie. 0°C & 101.3 kPa, 1 atm, 760 mm Hg

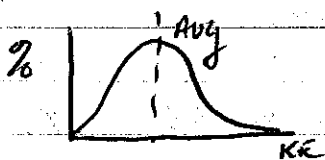
⑧ A graph showing the distribution of K.E. of the molecules of a substance (Maxwell-Boltzmann)



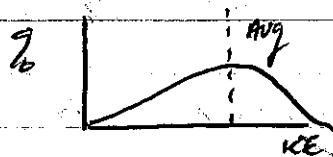
⑨ No, Some molecules have more energy, some have less. Temp is the measurement of avg. K.E.

⑩ As temp \uparrow , Avg K.E. \uparrow

ie.) AT 25°C



AT 37°C



⑪ Vapour Pressure (P_{vap}) - the pressure of the vapour above a liquid or solid
- must be measured in a closed container at constant temp.

⑫ As vapour leaves the liquid, they take energy from the liquid in the form of heat, leaving remaining liquid cooler (highest energy (hottest) particles escape)

⑬ As temp \uparrow , more vapour is produced, $\therefore P_{vap} \uparrow$

⑭ To boil, the molecules of a liquid must overcome the pressure of the atmosphere, ($P_{vap} \geq P_{atm}$) \therefore as P_{atm} changes, so will the boiling pt.

⑮ IMF's - are attractive forces b/w molecules.
 \Rightarrow Solids have the greatest & gases have the least.

⑯ Boiling point - is the temperature at which a substance goes from liq \rightarrow solid at any pressure.

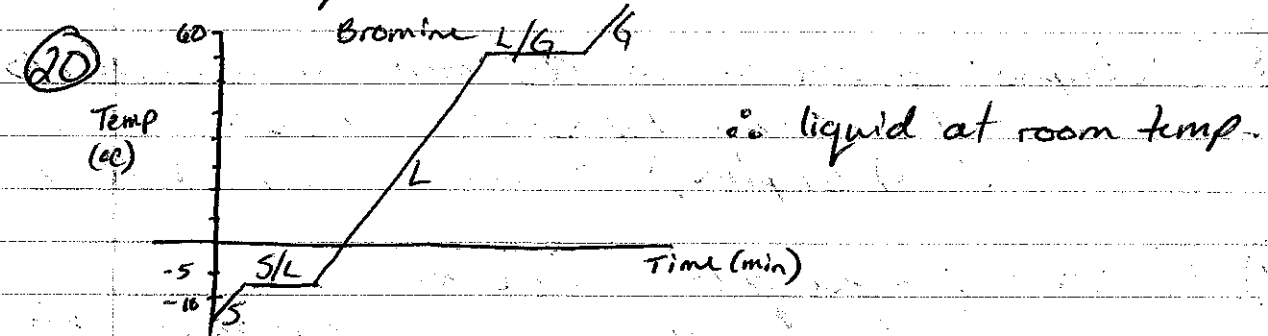
Normal Boiling Pt. - the temperature at which a substance boils at standard pressure (101.3 kPa, 760 mmHg, 1 atm)

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17) $\approx 30 \text{ kPa}$

18) Same concept as # 12

19) At the melting pt. energy is being absorbed by particles in solid state in order to change / state to a liquid.



21) To make water boil at room temp, lower P_{atm} below P_{vap} of H_2O . (use a vacuum)

22) Same concept as # 12 & 18

23) Same idea as moderating effects of large bodies of water. \Rightarrow water will give off energy to the cooler room moderating its temperature.

24) Sublimation - Change of state from solid \rightarrow gas.
 - ex. moth balls, air fresheners, dry ice

Deposition - Change of state from gas \rightarrow solid.
 - ex. frost.

25) See notes !!

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26)

A

B

C

120°C 25°C -10°C

a) A b) C c) C d) C e) B & C

27) Amorphous Solids → lack an regular arrangement of particles. ex) peanut butter
Crystalline Solids → Solids in a regular arrangement of particles. ex) Carbon (diamond)

28) Allotropes - Substances in different arrangements of the same type of particles.
ex) graphite, & diamond (both carbon)

29) Plasma - Ionized gas at high temp.
- low density, expands to fill container, etc.
- ex. lightning, stars, northern lights, t.v. ^v

30) See chart in notes.

31) a) Exo b) ENDO c) ENDO d) Exo e) ENDO f) exo

32) a) = 27 b) = 10 kPa c) = 61°C d) Chloroform.

e) Chloroform f) Acetic acid g) Chloroform

h) Chloroform = 59°C, Ethanol = 67°C, Water = 100°C, Acetic = 119

i) = 98°C j) = 45°C k) (i) has a higher P_{vap} than the others.

l) = 7°C m) Ethanol & Chloroform (P_{vap} > 20 kPa)