Announcements – 12/4/00

- **Final Exam:** Monday, 12/11, **8:30 am** (new time!)
  -Info page is now online!

- **EXTRA Review/Problem Sessions**
  -Thursday (12/7): noon - 2 pm, **B104** (new room!)
  -Sunday (12/10): 4:15 - 6:00 pm, B112

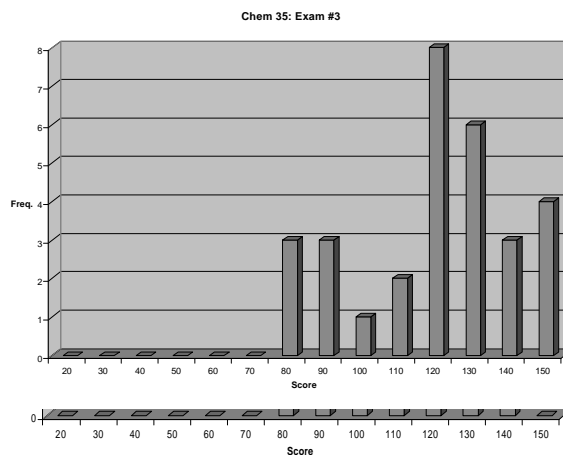- **Quiz and Exam#3 Addendum Results**
  -both handed back after class

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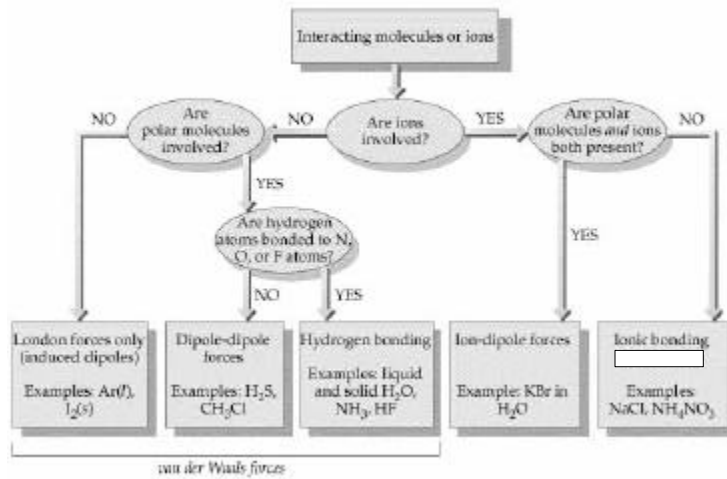# Exam #3 Results (revised)

OLD Average:
109/150
(73%)

OLD Range:
71 - 140

New Average:
114/150
(76%)

New Range:
71 - 150

Chem 35: Exam #3

Overview of IM-Forces

Some Properties of Liquids

- **Viscosity**
  -characterizes a liquid's *resistance to flow*
  -varies with the degree of intermolecular attraction

- **Surface Tension**
  -molecules on the surface of a bulk liquid experience intermolecular attraction *only* from molecules in the *bulk solution* below the surface

 -so, *surface molecules* are more **tightly packed** than molecules in the bulk solution

Adhesive and Cohesive Forces

- Attraction of molecules to a *surface* is due to *adhesive forces*
- Attraction of molecules to *each other* is due to *cohesive forces*
- **Examples:**
  -*Meniscus:*   adhesive > cohesive (water)
                       cohesive > adhesive (mercury)

  -*Capillary Action:* In a small-diameter tube, the *adhesive force* is sufficient to *increase the surface area of the liquid,* drawing the bulk liquid up into the tube.
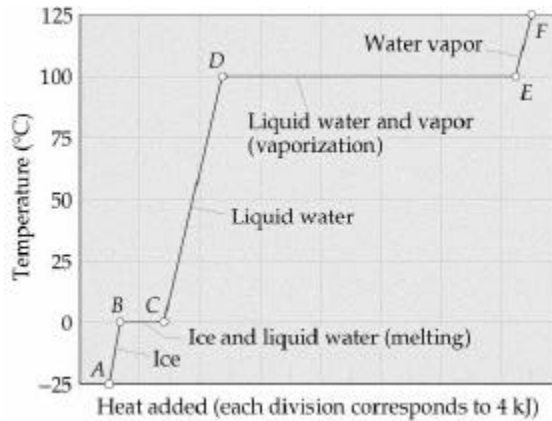
5

Energetics of Phase Changes
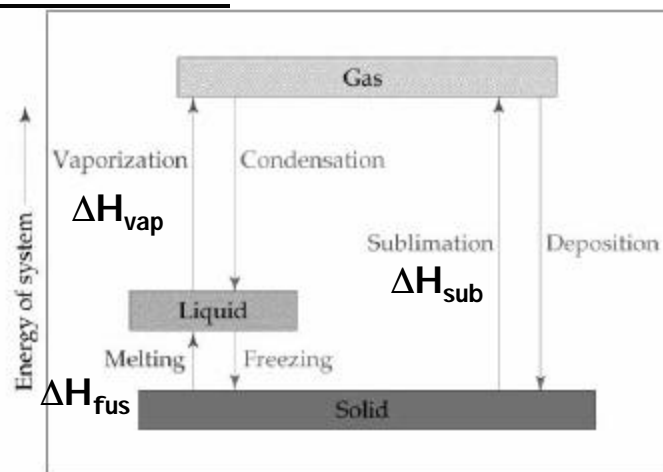
6

Heating Curves

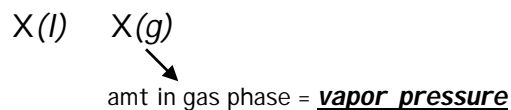■ How does the *temperature* of a system vary as a function of **added energy**?

125

100 — D ——————————— Water vapor — F

75 — Liquid water and vapor (vaporization) — E

50 — Liquid water

25

0 — B C — Ice and liquid water (melting)

−25 — A — Ice

Temperature (°C)

Heat added (each division corresponds to 4 kJ)

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Vapor Pressure

■ If we put a liquid in a container (and $V_{container}>V_{liquid}$ and $T<T_b$): *some of the liquid will vaporize*

Why?

■If molecules on the *surface* have sufficient <u>Kinetic Energy</u>, they can overcome <u>intermolecular attraction</u> and escape to the gas phase

■The **reverse** process can happen too!

■Process reaches a *steady state condition* (<u>equilibrium</u>):

X*(l)*   X*(g)*

amt in gas phase = ***vapor pressure***

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