

April 16, 2013 — Elective Experiments and Review

I. (30) Elective Experiments. Do only ONE of the following three problems; pick one that corresponds to your lab work. (Other choices will not be counted.)**A. Freezing Point Depression.**

- (a) $m = 0.2448 \text{ m}^\circ$ (b) $a = 0.1069$ (c) $K_m = 0.00313$
- (a) $m = 0.1372 \text{ m}^\circ$ (b) -0.7656 K (c) $f = 0.8634$ (d) $a_A = 0.99362$
- (a) $s_f = 0.0065$ (b) $s_m = 0.0037 \text{ m}^\circ$

B. Thermal Expansivity. [Hint: Precision is very important in all these calculations.]

- 0.0139 cm^3
- (a) 25.570 mL (b) 25.6005 mL
- (a) $5.334 \times 10^{-4} \text{ K}^{-1}$ (b) 28.28°C
- (a) 1.44% (b) 1.66%
- density at $x = 0$, or $t = 25^\circ\text{C}$

C. Physical Adsorption.

- (a) $P_2 = 68.7 \text{ Torr}$ (b) 7.449 STP cc (c) (i) 6.334 STPcc (ii) 1.115 STP cc
- 75.25 K
- 324 Torr

II. (21) Review.

- A. I – t, II – P (1) D (2) B (3) F (4) A (5) C & E

- B. (1) 0.9° (2) -1.5° (3) $\sim 95 \text{ s}$ (4) $\sim 135 \text{ s}$ (5) $0.0051/\text{s}$

C. (8) Data Analysis

- (a) $Y_i = y_i x_i^2$; $X_i = x_i^4$ (b) $w_i \propto 1/x_i^4$
- $$s_x/x = [(s_t/t)^2 + 4(s_u/u)^2 + (s_v/v)^2]^{1/2}$$

$$s_y/y = [(s_t/t)^2 + (s_u/u)^2 + (s_v/v)^2]^{1/2}$$

$$s_z/z = [(s_u/u)^2 + 4(s_v/v)^2]^{1/2}$$