11. The energy of micellization $mX \rightleftharpoons X_m$

$C(1-X)$ $\quad \frac{CX}{m}$

$$\Delta G = -\frac{RT}{m} \ln K = \frac{-RT}{m} \ln \frac{\frac{CX}{m}}{[C(1-X)]^m}$$

$$= -\frac{RT}{m}\left[\ln \frac{CX}{m} - m \ln C(1-X)\right]$$

at C.M.C., $X = 0$

$$\Rightarrow \Delta G = RT \ln C.M.C.$$

$$\Delta S = -\frac{d\Delta G}{dT} = -RT \frac{d \ln C.M.C}{dT} - R \ln C.M.C.$$

$$\Delta H = \Delta G + T\Delta S = RT \ln C.M.C - RT^2 \frac{d \ln C.M.C}{dT} - RT \ln C.M.C.$$

$$= -RT^2 \frac{d \ln C.M.C}{dT} \leftarrow$$

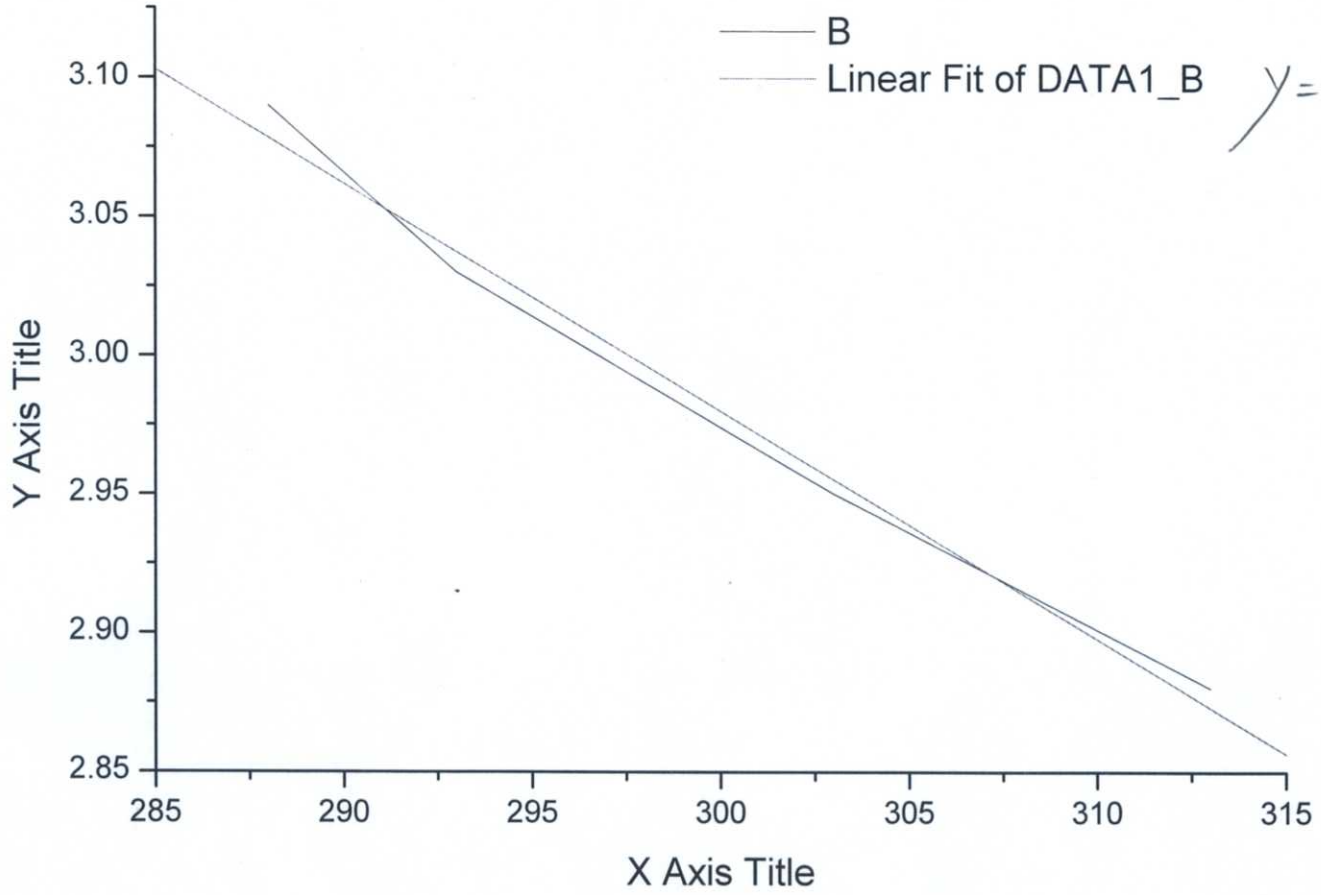
$$\Rightarrow \Delta H = -RT^2 \frac{d \ln C.M.C}{dT}$$

T.(K)	288	293.	298.	303.	313
C.M.C ($\frac{mmol}{dm^3}$)	21.9	20.8	19.9	19.1	17.8
ln C.M.C.	3.09	3.03	2.99	2.95	2.88

$$\Rightarrow \frac{d \ln C.M.C}{dT} = -0.00822$$

$$\Delta H = -8.314 \times (300)^2 \times -0.00822 = 6150. \text{ J/mol}$$

(吸热)


B
Linear Fit of DATA1_B
y = 3.44465 - 0.00822x
Y Axis Title
3.10
3.05
3.00
2.95
2.90
2.85
285
290
295
300
305
310
315
X Axis Title

11.

$$\Delta H = -RT^2 \frac{d \ln C.M.C}{dT}$$

$$-\frac{\Delta H}{RT^2} dT = d \ln C.M.C \quad \text{两边积分}$$

$$\Rightarrow \ln C.M.C = \frac{\Delta H}{R} \times \frac{1}{T} + C$$

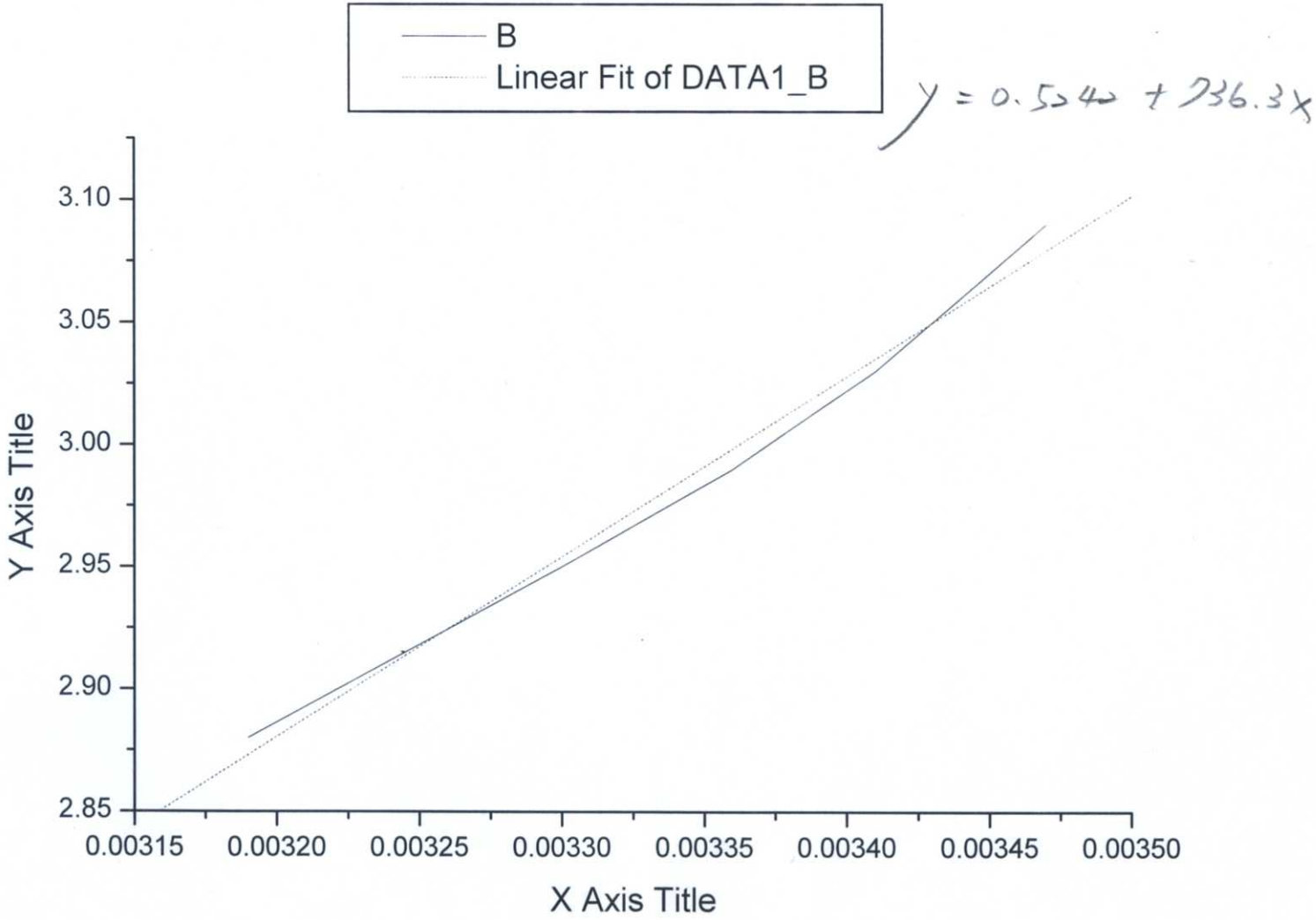
$\ln C.M.C$	3.09	3.03	2.99	2.95	2.88
$\frac{1}{T}$	3.47×10^{-3}	3.41×10^{-3}	3.36×10^{-3}	3.3×10^{-3}	3.19×10^{-3}

$$y = 0.5240 + 7136.3x$$

$$\frac{dy}{dx} = \frac{\Delta H}{R} = 7136.3$$

$$\Rightarrow \Delta H = 7136.3 \times 8.314 = 61021 \ J/m.$$

-2.


B
Linear Fit of DATA1_B
y = 0.54x + 736.3x
3.10
3.05
3.00
2.95
2.90
2.85
Y Axis Title
0.00315
0.00320
0.00325
0.00330
0.00335
0.00340
0.00345
0.00350
X Axis Title