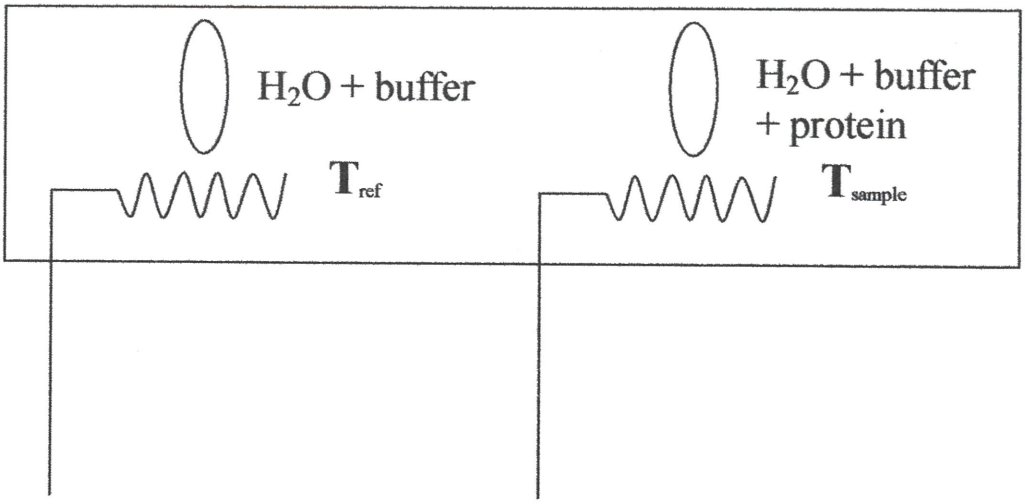
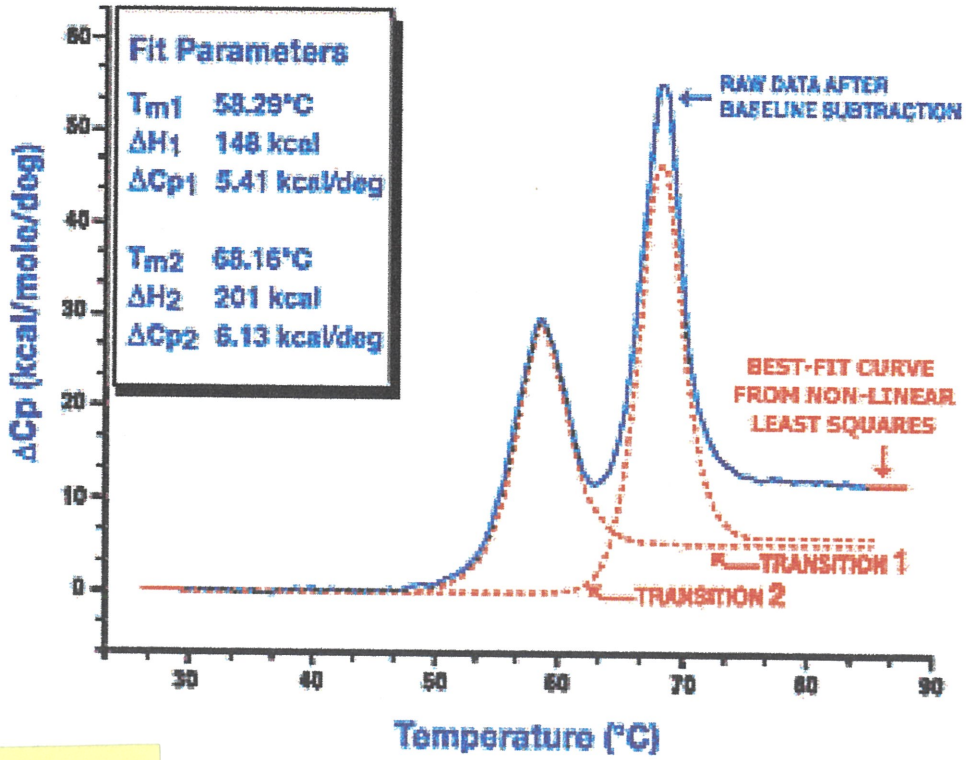
Run off 10 more cycle of each done

Differential Scanning Calorimeter





VP. Friday 在 ER 上課 欲用 overhead 已 O.K. 要 hard copy

(1) Heat both the reference and the sample to maintain

$$T_{ref} = T_{sample}$$

(2) Scan temperature slowly, varying T

(3) $$(dQ_P^{ref}/dT) = C_P^{ref}$$

$$(dQ_P^{sample}/dT) = C_P^{sample}$$

(4) Excess heat capacity = $C_P^{sample} - C_P^{ref}$

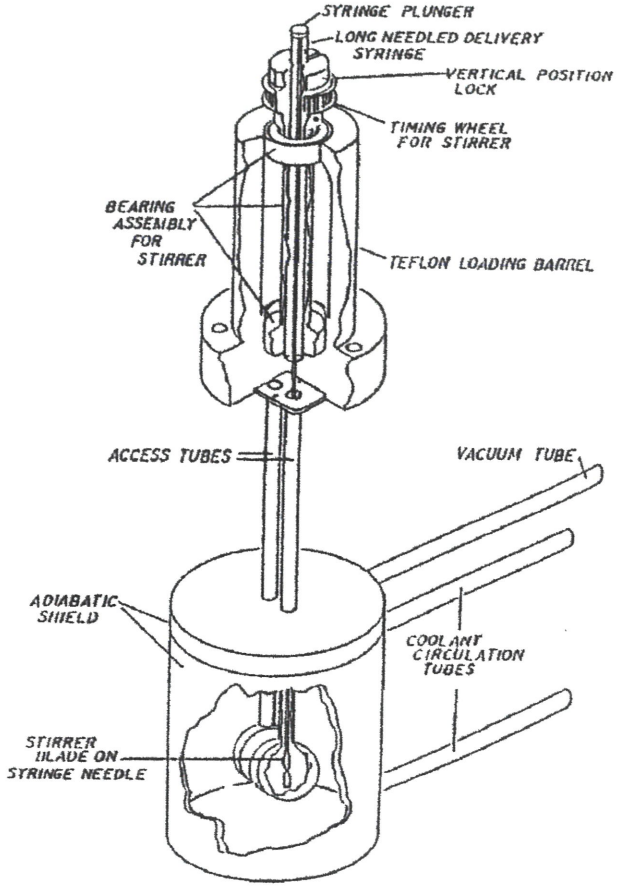
Isothermal titration calorimetry

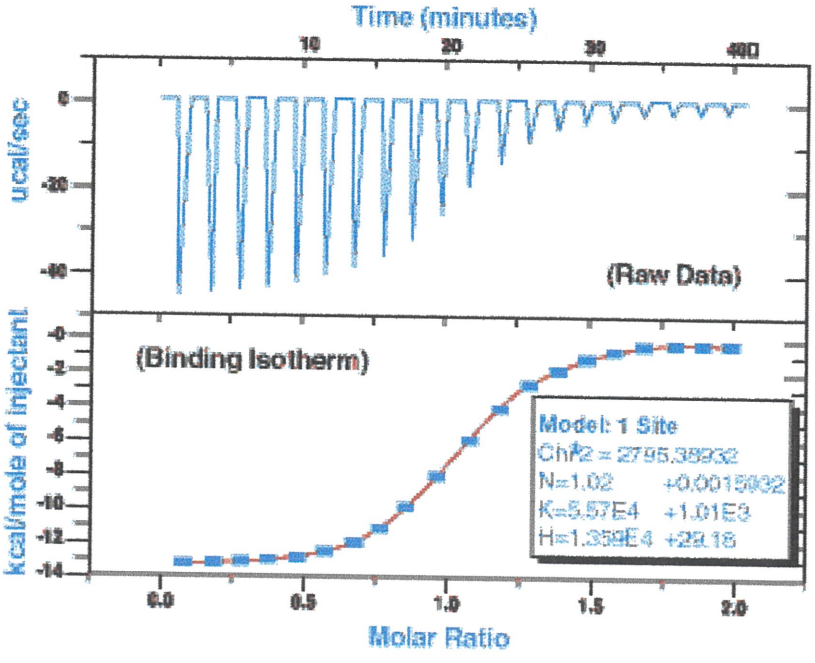
The Basics Isothermal Titration Calorimetry (ITC) is a technique that allows the investigator to study the heat of interaction between two molecules. In ITC a syringe containing a "ligand" is titrated into a cell containing a solution of the "macromolecule". As the two elements interact, heat is released or absorbed in direct proportion to the amount of binding that occurs. When the macromolecule in the cell becomes saturated with added ligand, the heat signal diminishes until only the background heat of dilution is observed.

The area underneath each injection peak (top panel) is equal to the total heat released for that injection. When this is plotted against the molar ratio of ligand added to macromolecule in the cell, a complete binding isotherm for the ineraction is obtained (bottom panel).

With the MicroCal VP-ITC system the entire experiment takes place under computer control. The user inputs the experimental parameters (temperature, number of injection, injection volumes) and the computer carries out the experiment. Vendor software is then used to analyze the ITC data.

ITC is a true in-solution method. It does not require immobilization of binding components as in surface plasmon resonance (SPR), or chemical tagging as with fluorometry. ITC is much faster than alternative analytical methods like ultracentrifugation (AUC). Whereas a single AUC experiment can take hours or even days to complete, a typical ITC experiment requires only about 30-60 minutes, with only a few minutes of "hands-on time". ITC provides more comprehensive information about a binding process than does SPR and AUC as ITC measures an entire set of experimental parameters: binding affinity (KA), binding stoichiometry (n), heat (H), and heat capacity (Cp) of binding. All are typically obtained from a single experiment, making ITC a far more versatile method than either SPR or AUC.


SYRINGE PLUNGER
LONG NEEDLED DELIVERY SYRINGE
VERTICAL POSITION LOCK
TIMING WHEEL FOR STIRRER
BEARING ASSEMBLY FOR STIRRER
TEFLON LOADING BARREL
ACCESS TUBES
VACUUM TUBE
ADIABATIC SHIELD
COOLANT CIRCULATION TUBES
STIRRER BLADE ON SYRINGE NEEDLE


Time (minutes)
10
20
30
40
ucal/sec
0
-20
-40
(Raw Data)
kcal/mole of injectant
(Binding Isotherm)
Model: 1 Site
Chi^2 = 2795.38932
N=1.02 +0.0015932
K=5.57E4 +1.01E3
H=-1.359E4 +29.18
0.0
0.5
1.0
1.5
2.0
Molar Ratio