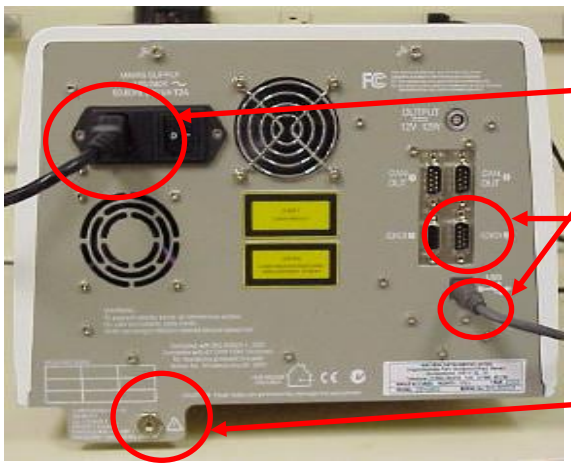
Malvern Zetasizer Nano Series

中文操作手冊

Made by Laura of DKSH Taiwan Ltd. 20/03/2014

一、　　儀器安裝

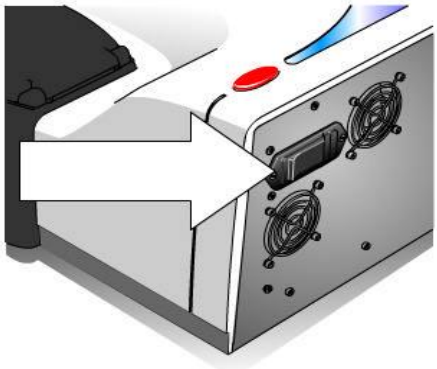


接上儀器電源線，以及連接電腦的 USB 線

自動滴定器連接 port

可以接乾燥空氣或氮氣

二、　　開機



1. 軟體安裝完成，再開啟儀器主機
2. 電源需接地
3. 遠離水源與震源

開機時溫度檢測會響”嗶”一聲
儀器自我檢測會響”嗶”三聲

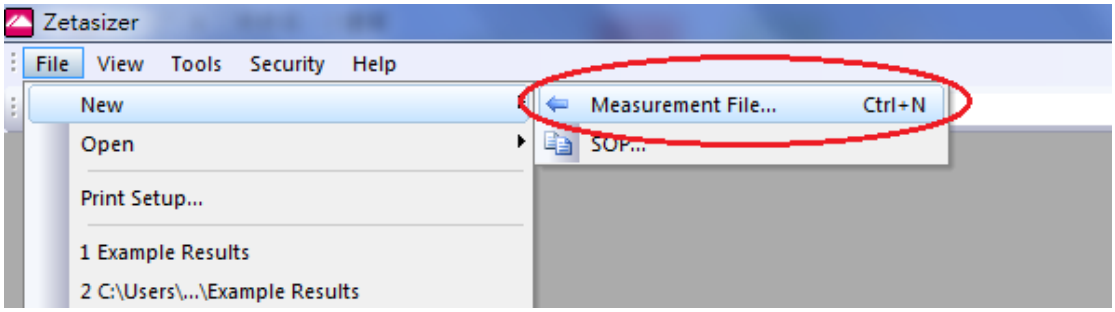
1. 軟體安裝完成後，將儀器之 USB 線接上電腦

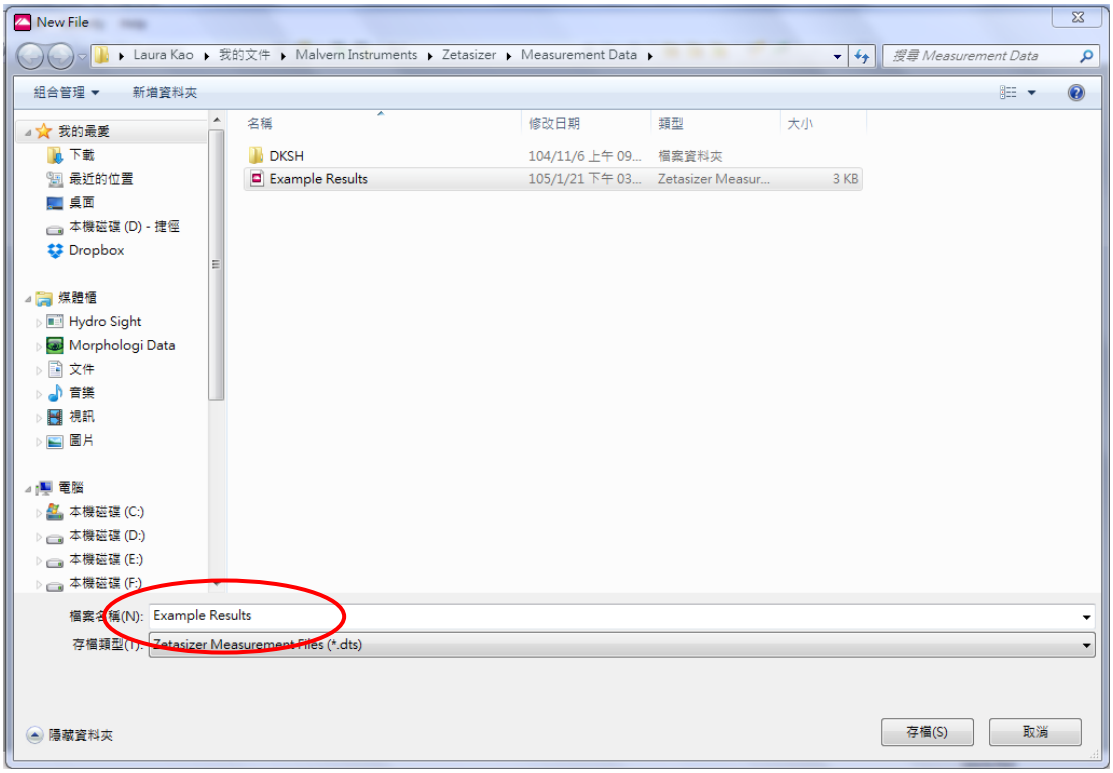
2. Window 系統將會自動安裝驅動程式(此時請勿打開軟體)

3. 驅動程式安裝完成後，點選桌面捷徑 ，即可開始量測

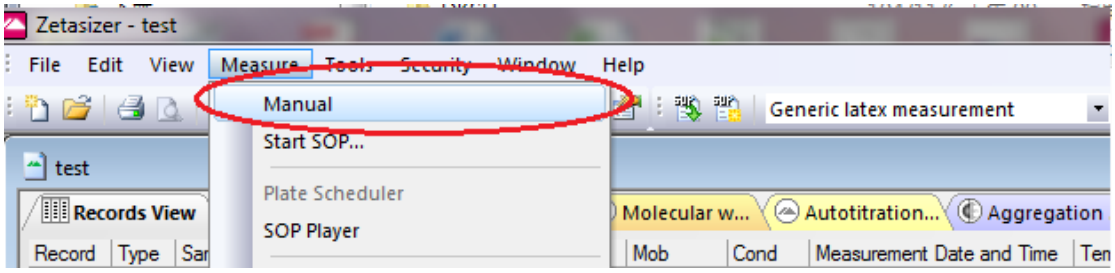
三、 軟體操作

1. 開新檔案 File > New > Measurement File > 輸入檔名 > Save

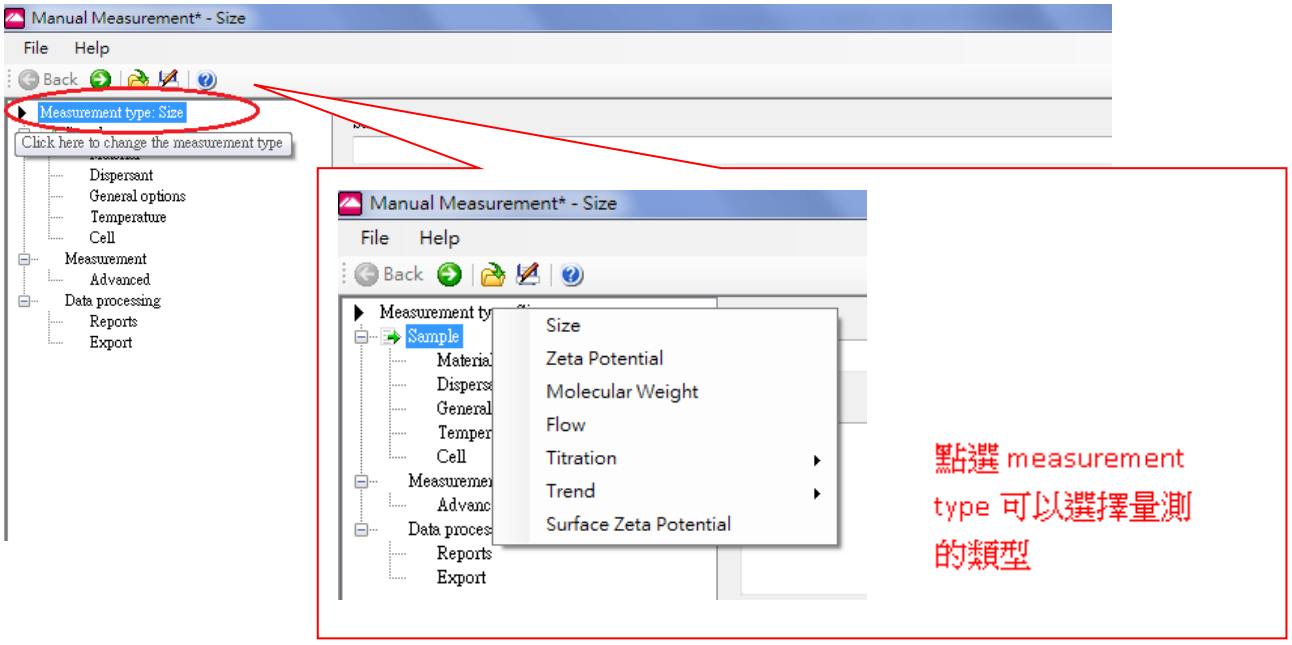




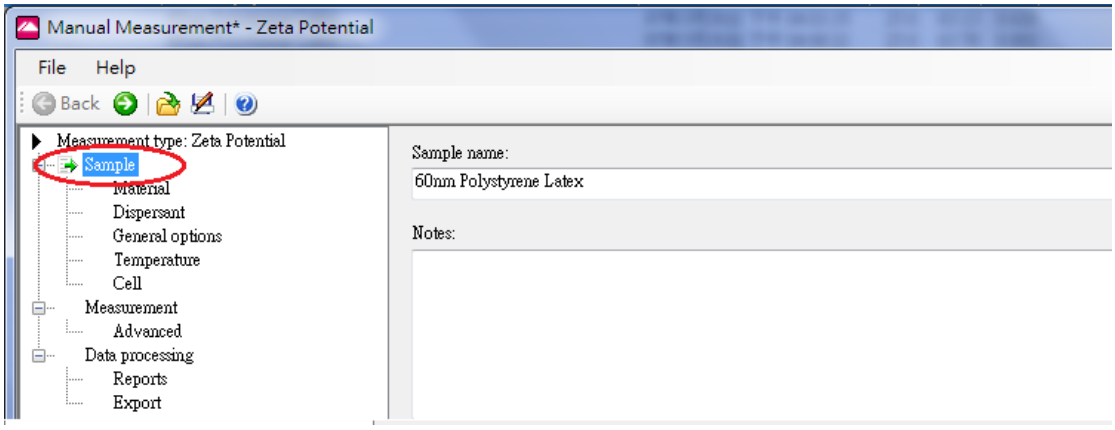
2. 開啟手動量測，選擇 Measure > Manual



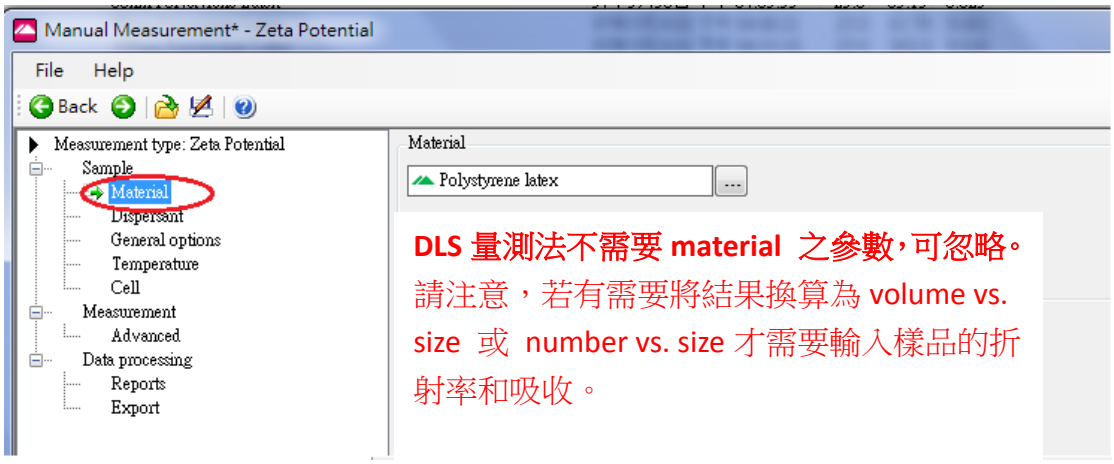
3. 點選 ”Measurement Type”, 選取量測類型



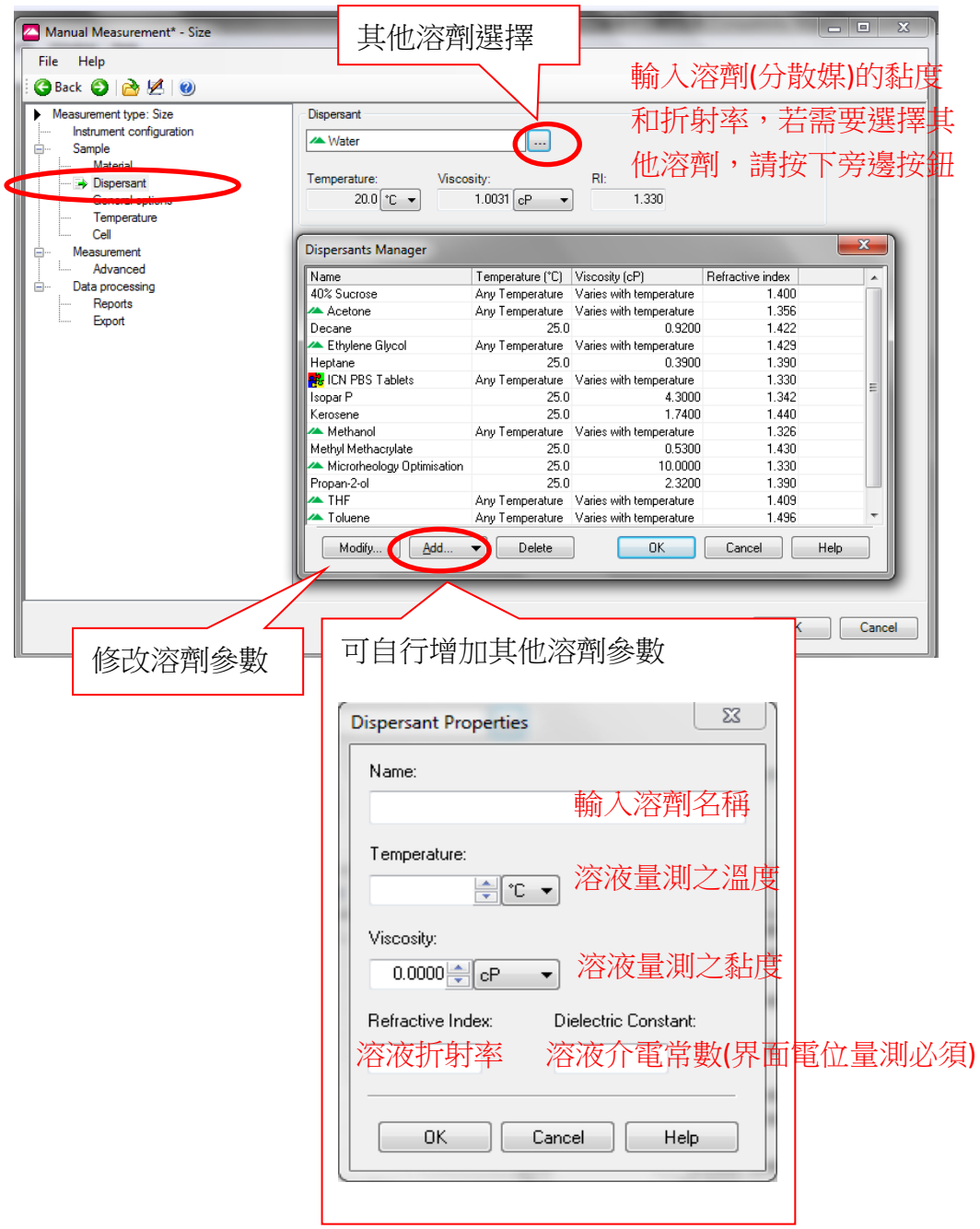
4. 輸入樣品名稱及備註



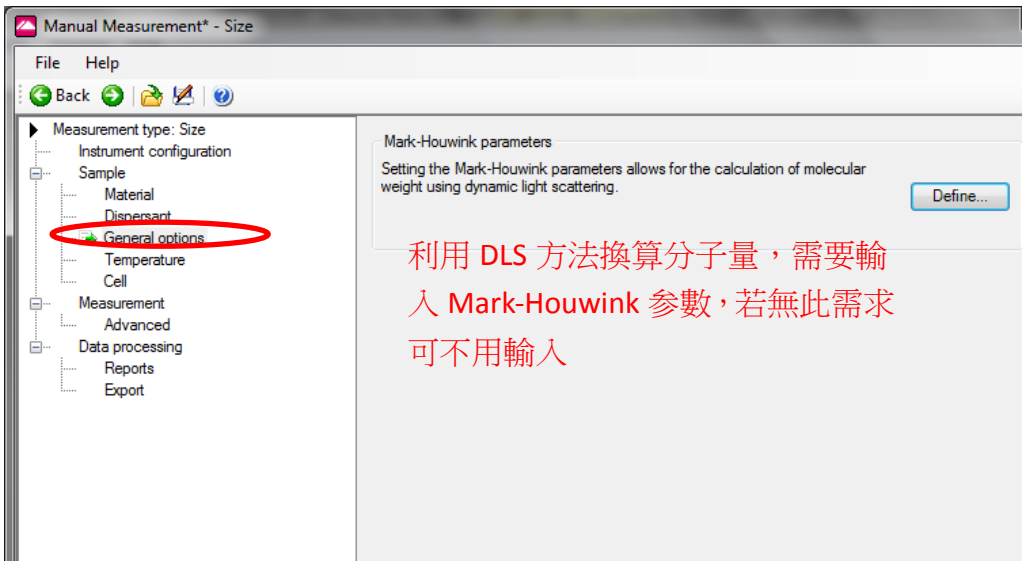
5. 設定 Material 的參數



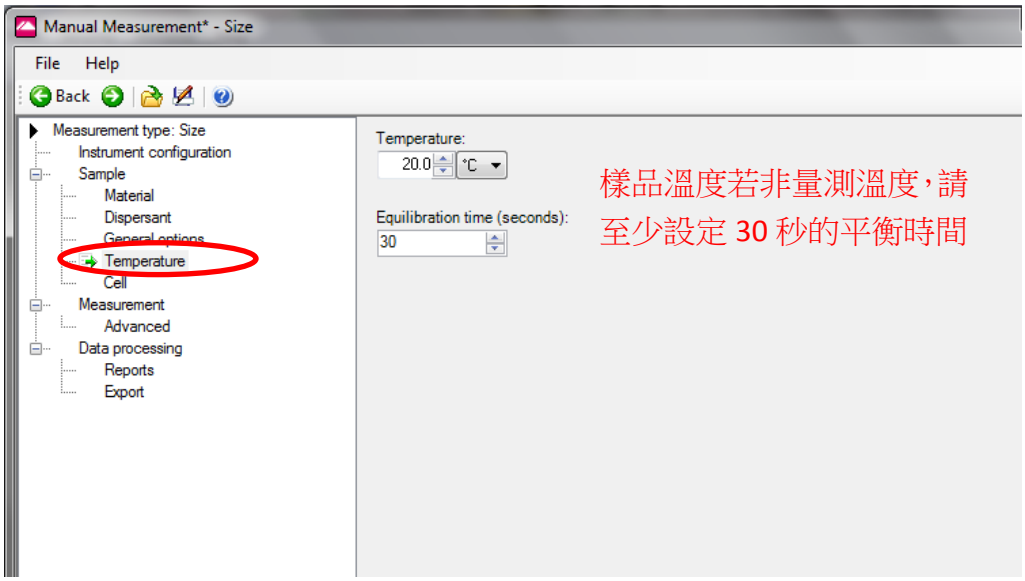
6. 設定分散液的參數


Manual Measurement* - Size
File Help
Back
Measurement type: Size
Instrument configuration
Sample
Material
Dispersant
Temperature
Cell
Measurement
Advanced
Data processing
Reports
Export
Dispersant
Water
Temperature:
20.0 °C
Viscosity:
1.0031 cP
RI:
1.330
Cancel
Dispersants Manager
Name | Temperature (°C) | Viscosity (cP) | Refractive index
40% Sucrose | Any Temperature | Varies with temperature | 1.400
Acetone | Any Temperature | Varies with temperature | 1.356
Decane | 25.0 | 0.9200 | 1.422
Ethylene Glycol | Any Temperature | Varies with temperature | 1.429
Heptane | 25.0 | 0.3900 | 1.390
ICN PBS Tablets | Any Temperature | Varies with temperature | 1.330
Isopar P | 25.0 | 4.3000 | 1.342
Kerosene | 25.0 | 1.7400 | 1.440
Methanol | Any Temperature | Varies with temperature | 1.326
Methyl Methacrylate | 25.0 | 0.5300 | 1.430
Microrheology Optimisation | 25.0 | 10.0000 | 1.330
Propan-2-ol | 25.0 | 2.3200 | 1.390
THF | Any Temperature | Varies with temperature | 1.409
Toluene | Any Temperature | Varies with temperature | 1.496
Modify... Add... Delete OK Cancel Help
其他溶劑選擇
輸入溶劑(分散媒)的黏度和折射率，若需要選擇其他溶劑，請按下旁邊按鈕
修改溶劑參數
可自行增加其他溶劑參數
Dispersant Properties
Name:
輸入溶劑名稱
Temperature:
°C
溶液量測之溫度
Viscosity:
0.0000 cP
溶液量測之黏度
Refractive Index:
溶液折射率
Dielectric Constant:
溶液介電常數(界面電位量測必須)
OK Cancel Help

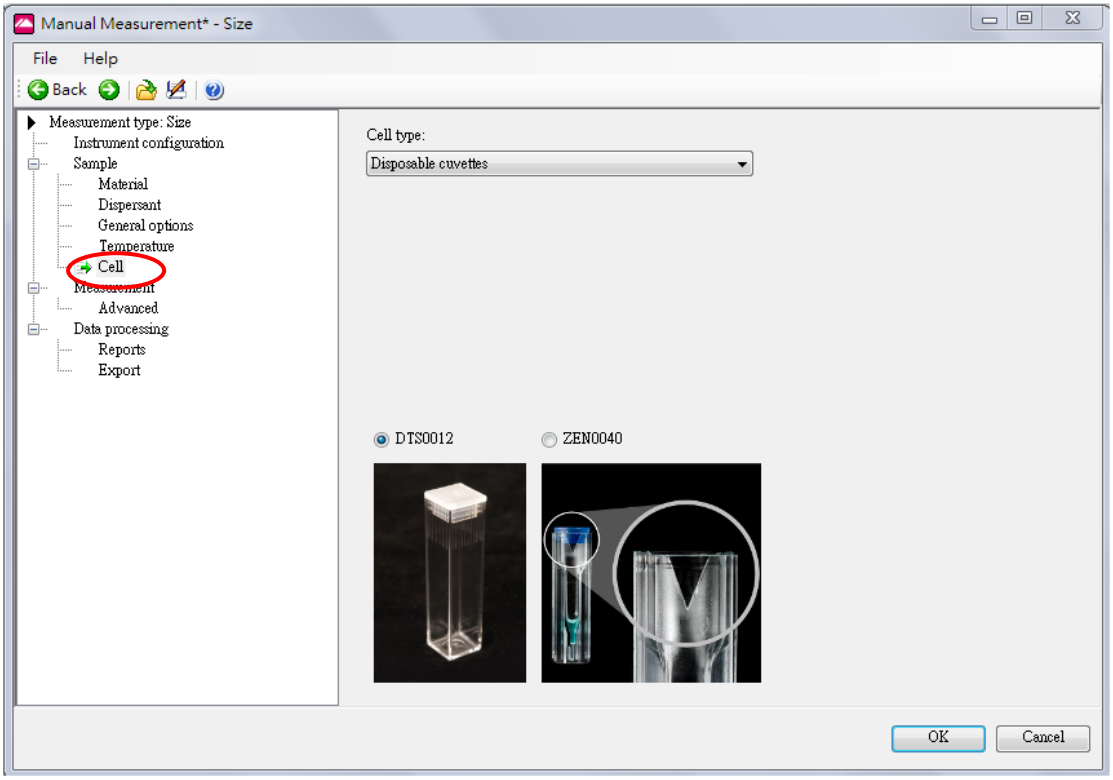
3. 分子量計算參數設定，可忽略



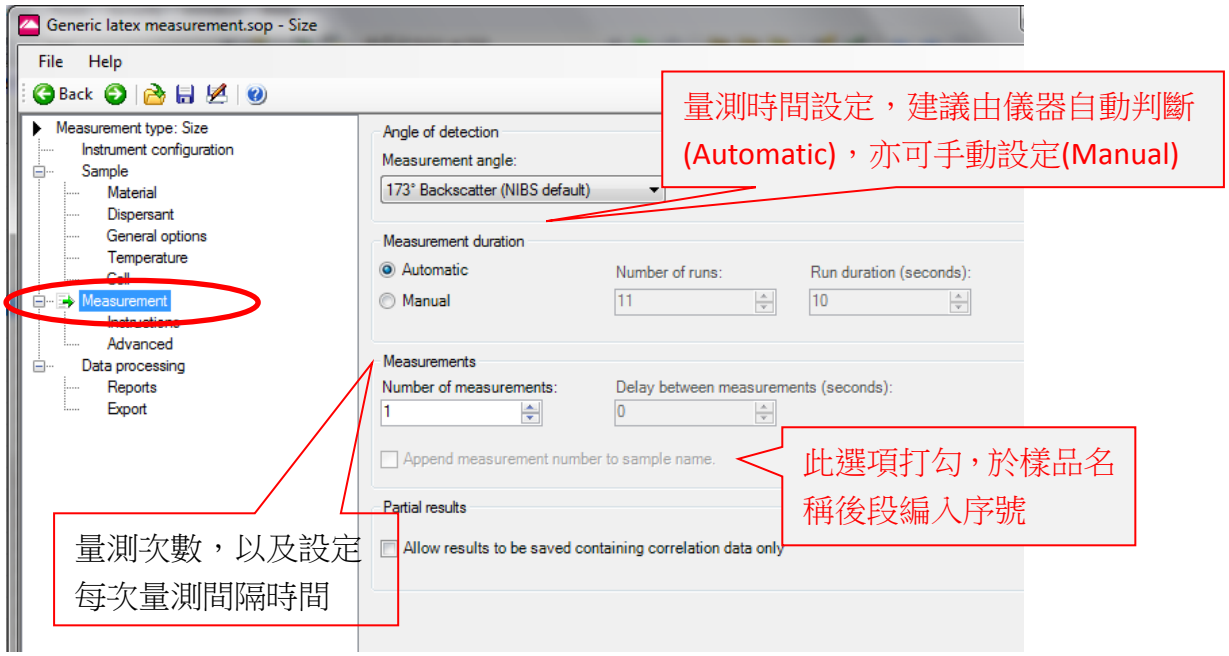
4. 設定量測溫度，以及溫度平衡時間



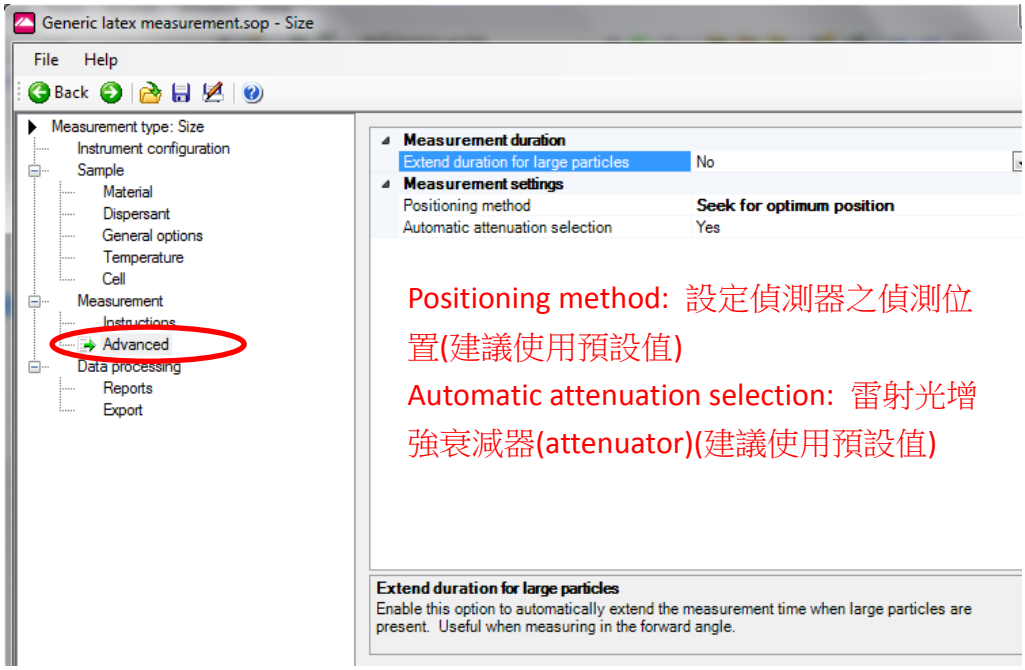
5. 選擇正確型號的 cuvette



6. 設定量測時間 、量測次數 、每次量測間隔時間



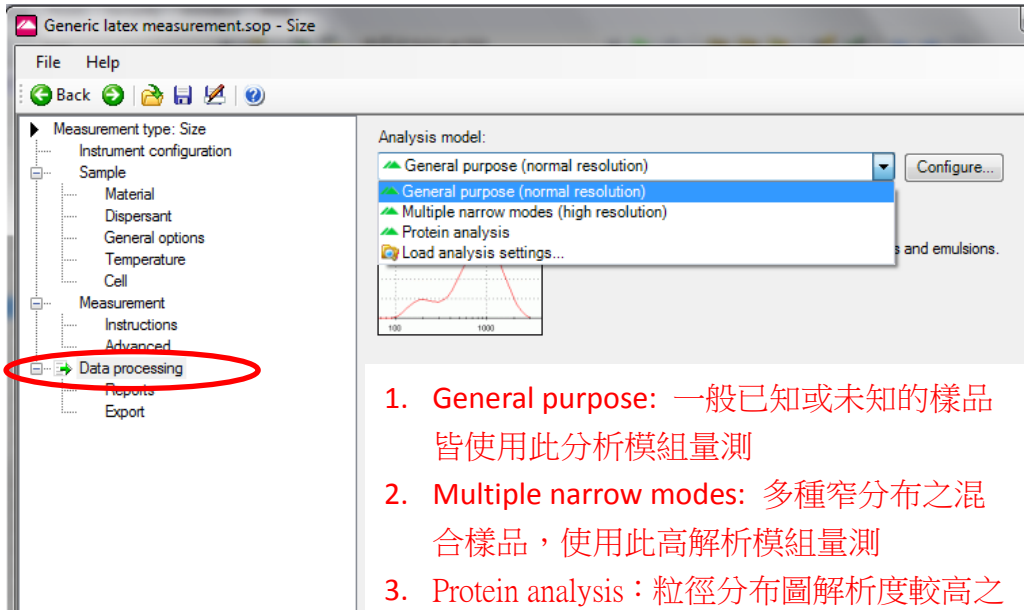
7. 偵測位置及衰減器設定



Positioning method: 設定偵測器之偵測位置(建議使用預設值)

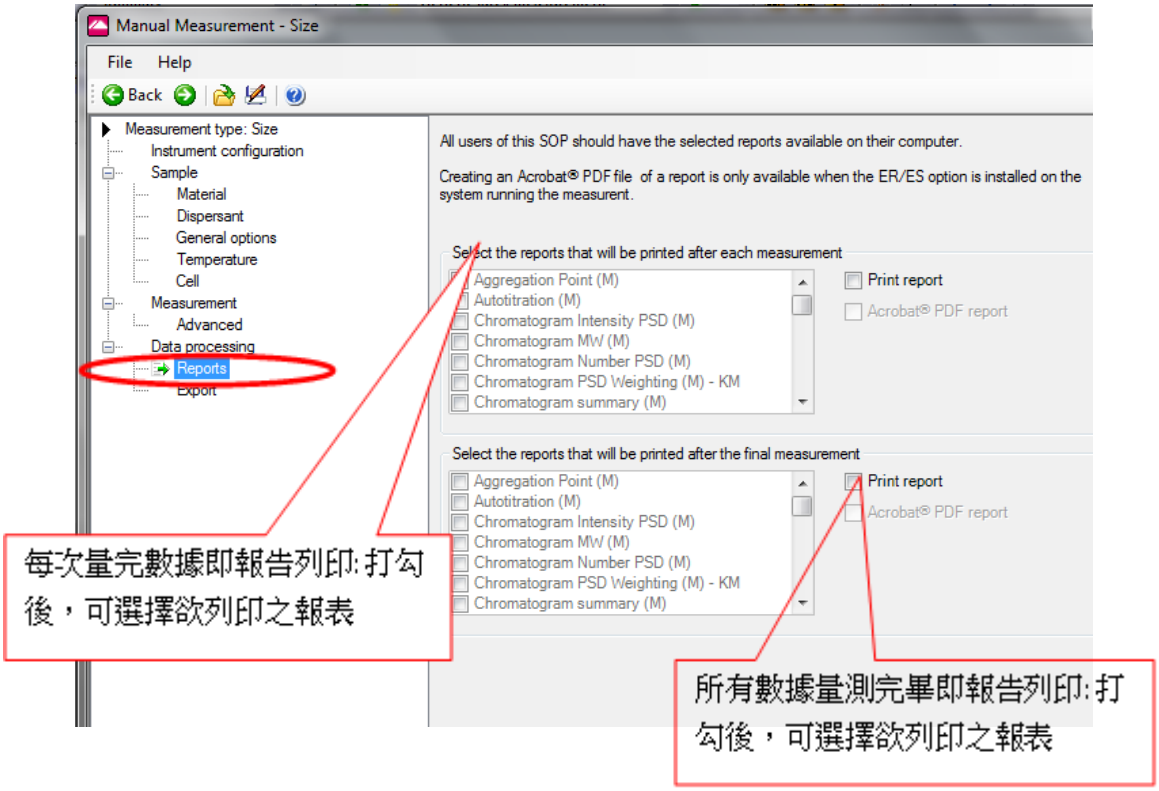
Automatic attenuation selection: 雷射光增強衰減器(attenuator)(建議使用預設值)

8. 設定分析模組，建議使用預設模式

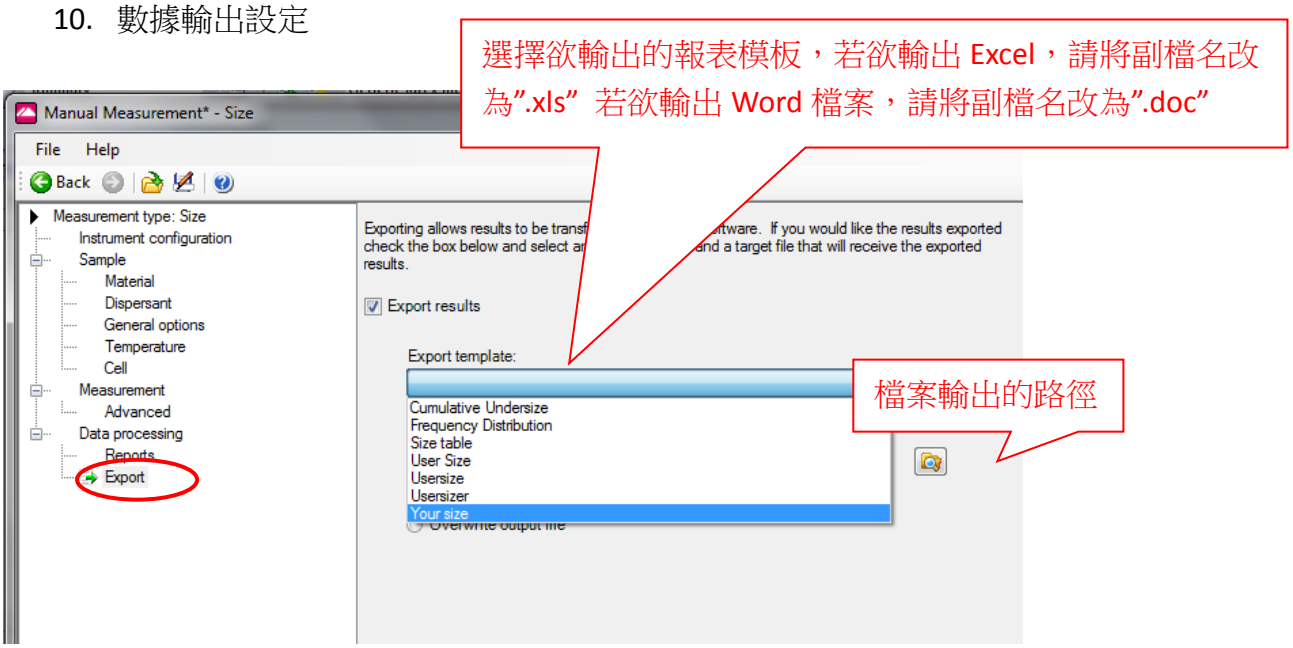


1. General purpose: 一般已知或未知的樣品皆使用此分析模組量測
2. Multiple narrow modes: 多種窄分布之混合樣品，使用此高解析模組量測
3. Protein analysis：粒徑分布圖解析度較高之設定

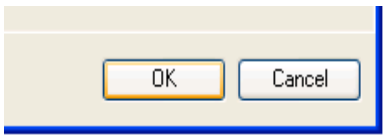
9. 設定每筆量測結束後列印報告，或所有量測結束後列印報告



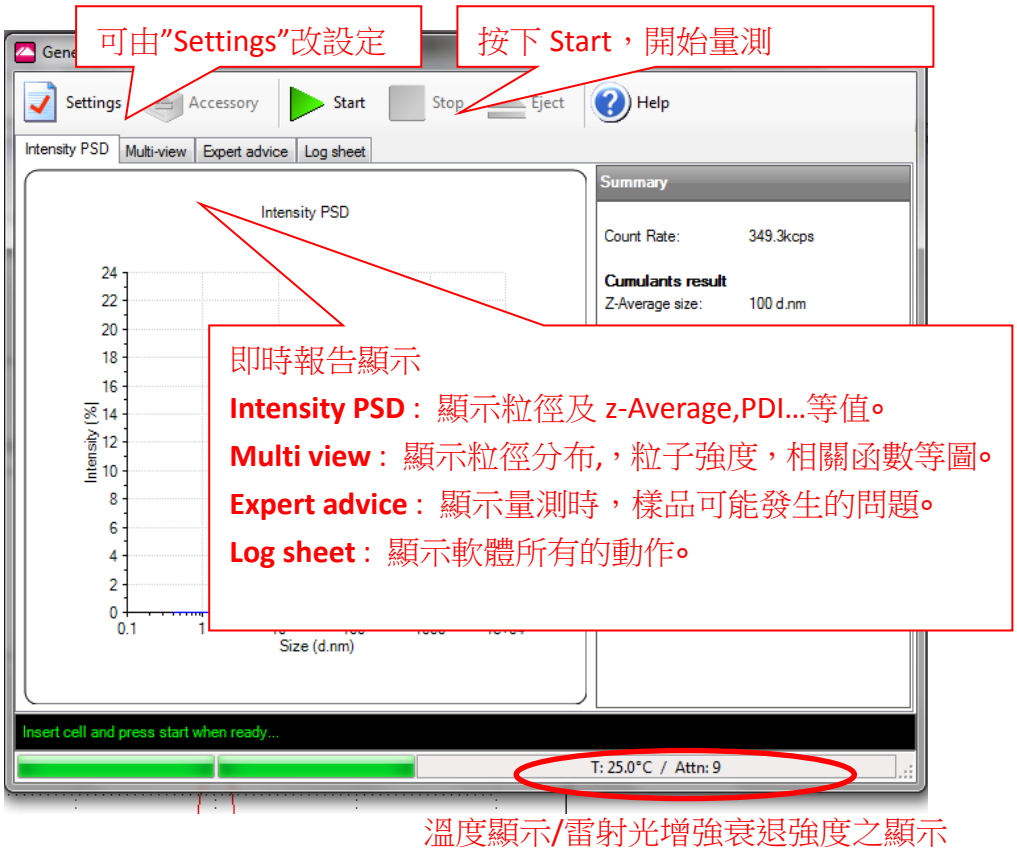
10. 數據輸出設定



11. 設定完成後按下 OK 即出現以下分析視窗



12. 量測視窗開啟

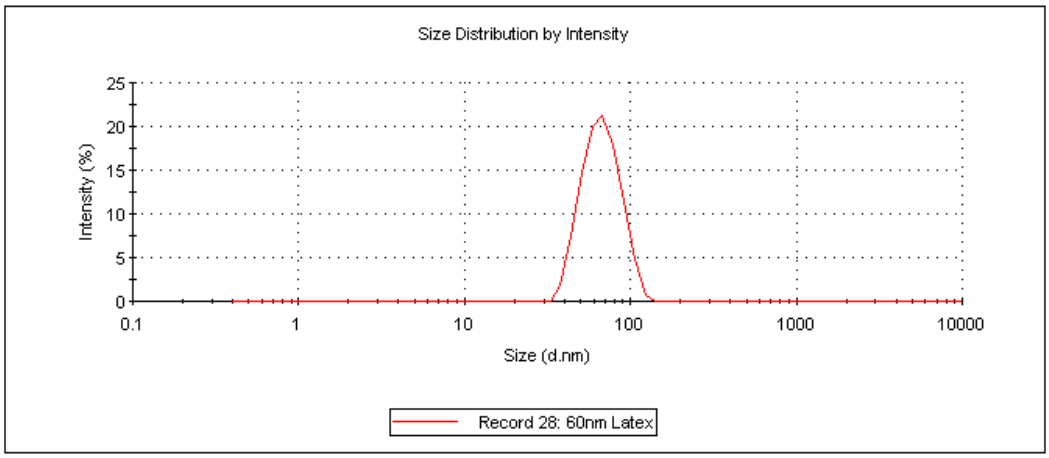


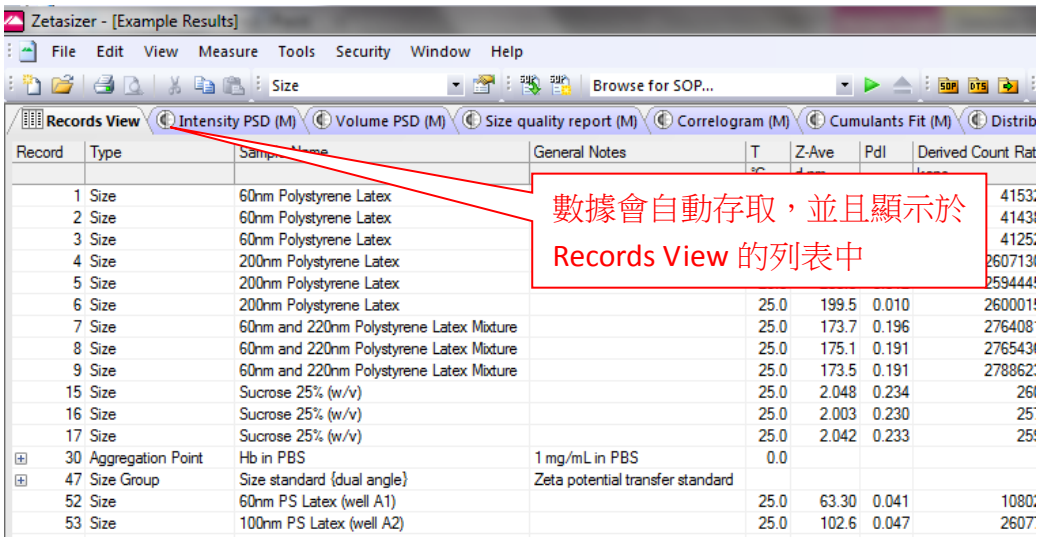
四、 量測結果報告

Sample Name:	60nm Latex		
SOP Name:	Manual measurement settings		
File Name:	Example Results.dts	**Dispersant Name:**	Water
Record Number:	28	**Dispersant RI:**	1.330
Material RI:	1.59	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.01	**Measurement Date and Time:**	2007年1月8日 上午 09:55:16

Temperature (°C):	25.0	**Duration Used (s):**	70
Count Rate (kcps):	189.7	**Measurement Position (mm):**	4.65
Cell Description:	Disposable sizing cuvette	**Attenuator:**	6

			Diam. (nm)	% Intensity	Width (nm)
Z-Average (d.nm):	64.38	**Peak 1:**	68.11	100.0	17.16
PdI:	0.035	**Peak 2:**	0.000	0.0	0.000
Intercept:	0.912	**Peak 3:**	0.000	0.0	0.000
Result quality :	Good				



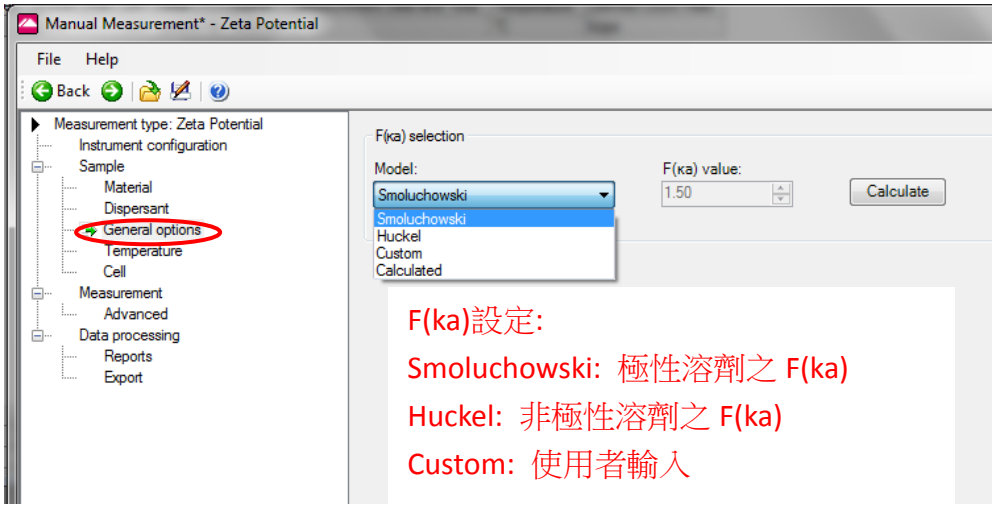


Record	Type	Sample Name	General Notes	T	Z-Ave	PdI	Derived Count Rat
1	Size	60nm Polystyrene Latex					4153
2	Size	60nm Polystyrene Latex					4143
3	Size	60nm Polystyrene Latex					4125
4	Size	200nm Polystyrene Latex					2607130
5	Size	200nm Polystyrene Latex					2594445
6	Size	200nm Polystyrene Latex		25.0	199.5	0.010	260001
7	Size	60nm and 220nm Polystyrene Latex Mixture		25.0	173.7	0.196	276408
8	Size	60nm and 220nm Polystyrene Latex Mixture		25.0	175.1	0.191	276543
9	Size	60nm and 220nm Polystyrene Latex Mixture		25.0	173.5	0.191	278862
15	Size	Sucrose 25% (w/v)		25.0	2.048	0.234	26
16	Size	Sucrose 25% (w/v)		25.0	2.003	0.230	25
17	Size	Sucrose 25% (w/v)		25.0	2.042	0.233	25
30	Aggregation Point	Hb in PBS	1 mg/mL in PBS	0.0			
47	Size Group	Size standard {dual angle}	Zeta potential transfer standard				
52	Size	60nm PS Latex (well A1)		25.0	63.30	0.041	1080
53	Size	100nm PS Latex (well A2)		25.0	102.6	0.047	2607

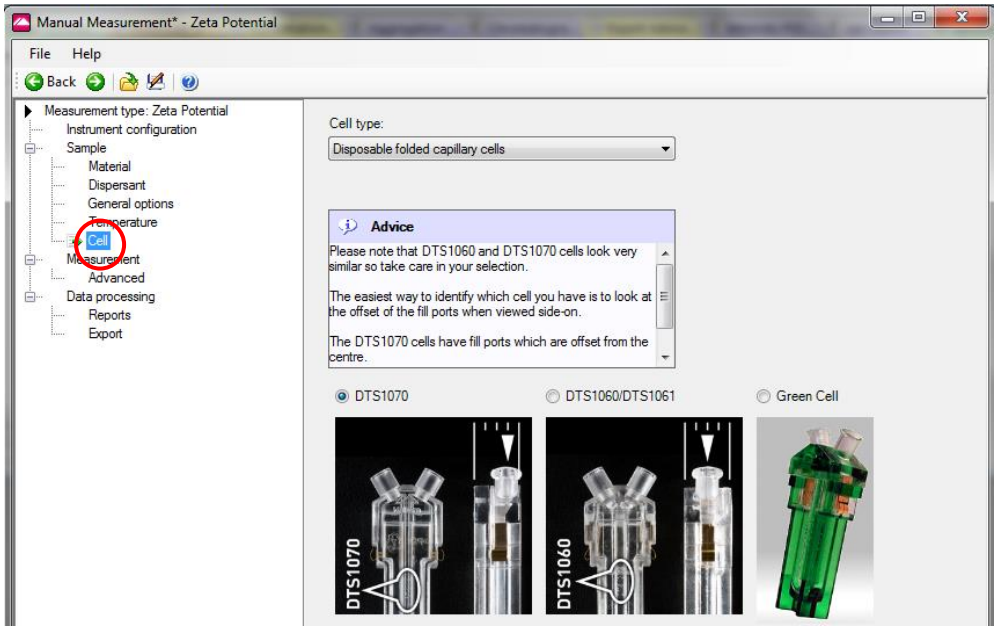
五、 Zeta potential 設定:

大部分設定與 size 相同，以下僅提出需要注意的地方

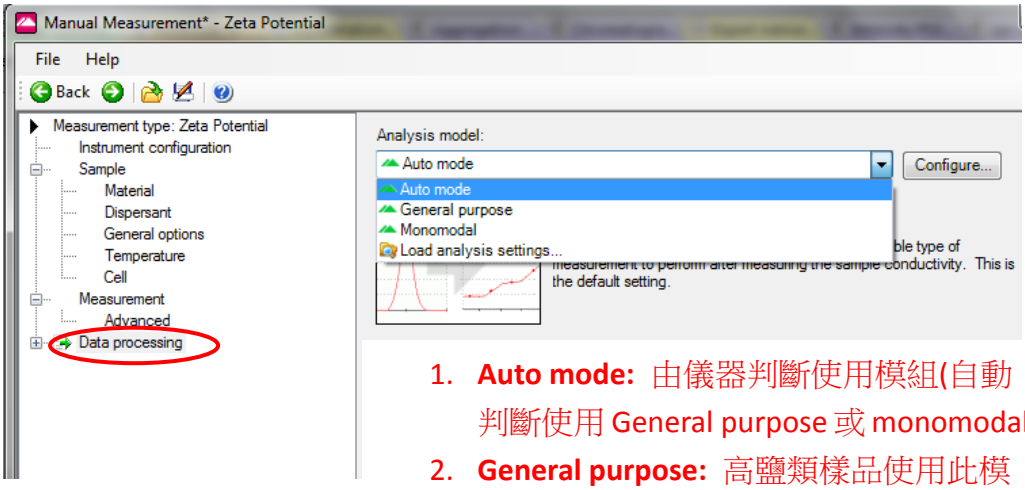
1. F(Ka)設定



2. 選擇正確型號的 Zeta Cell



3. 設定分析模組，建議使用預設模式

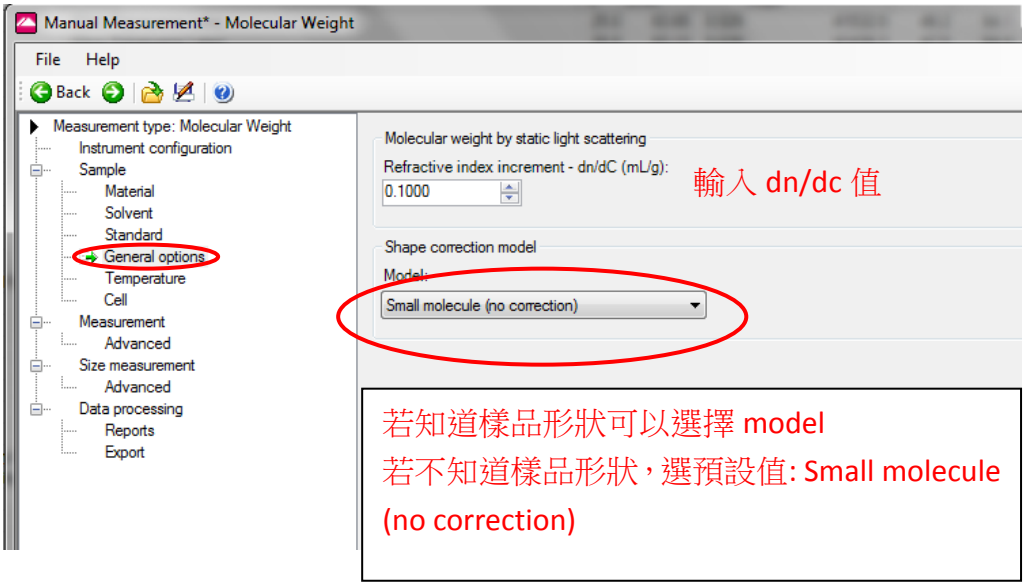


1. **Auto mode:** 由儀器判斷使用模組(自動判斷使用 General purpose 或 monomodal)
2. **General purpose:** 高鹽類樣品使用此模組
3. **Monomodal:** 高導電度(高鹽類)樣品使用此模組

六、 分子量設定

大部分設定與 size 相同，以下僅提出需要注意的地方

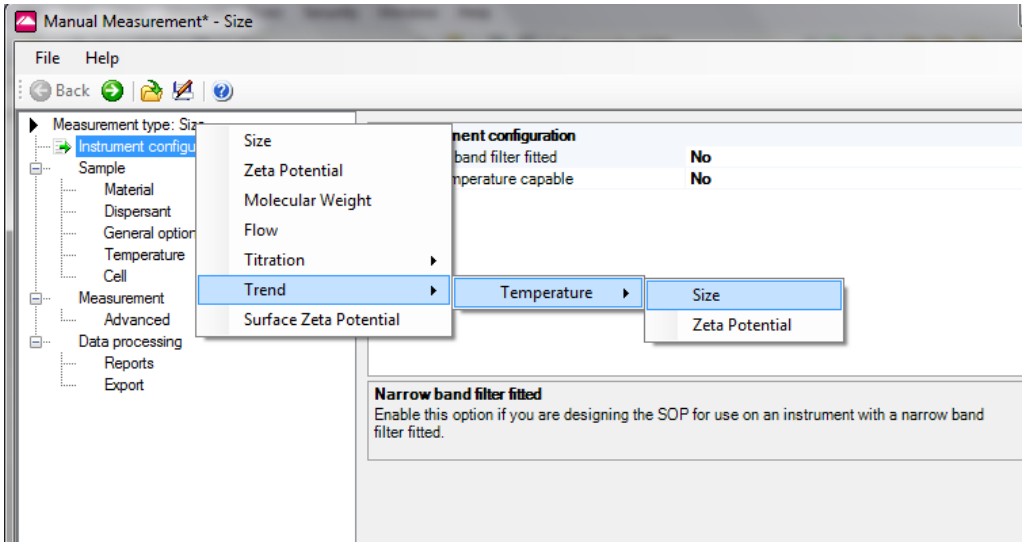
1. 參數值設定



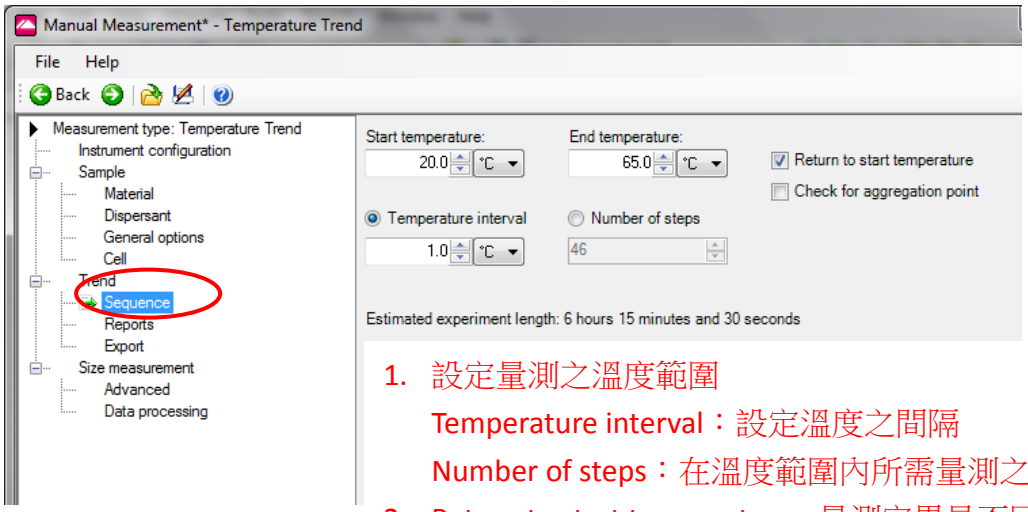
七、 Temperature Trend

大部分設定與前述相同，以下僅提出需要注意的地方

1. 可選擇 Size 或 Zeta Potential 對溫度變化的量測



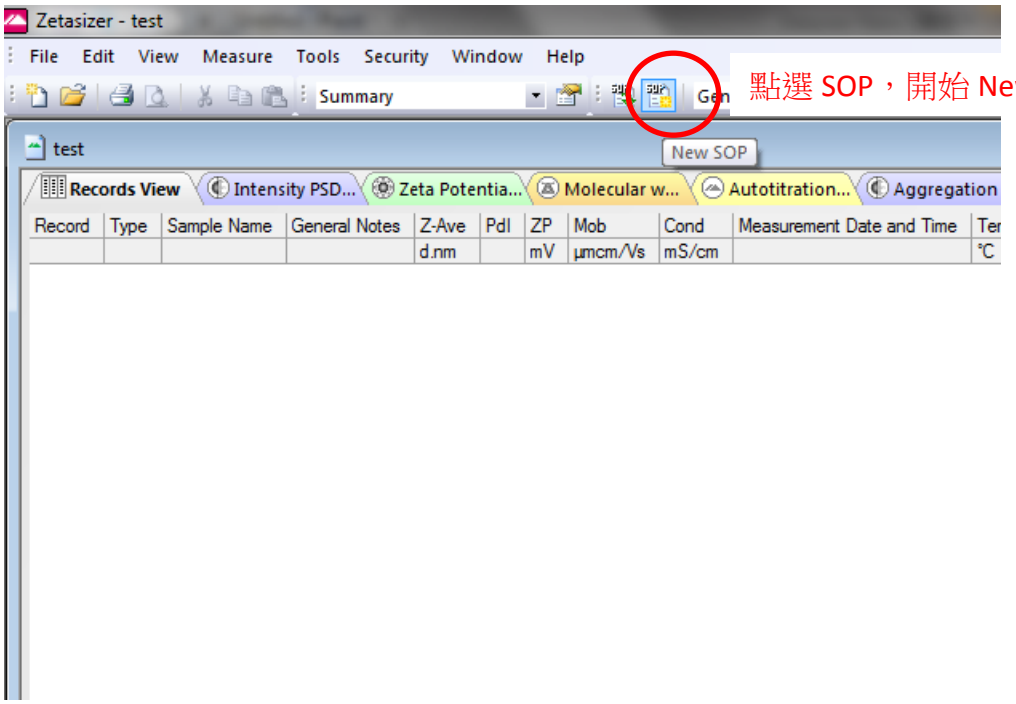
2. 設定量測參數



1. 設定量測之溫度範圍
   Temperature interval：設定溫度之間隔
   Number of steps：在溫度範圍內所需量測之節點
2. Return to start temperature: 量測完畢是否回歸到初始溫度
3. Check for aggregation point: 檢查團聚點

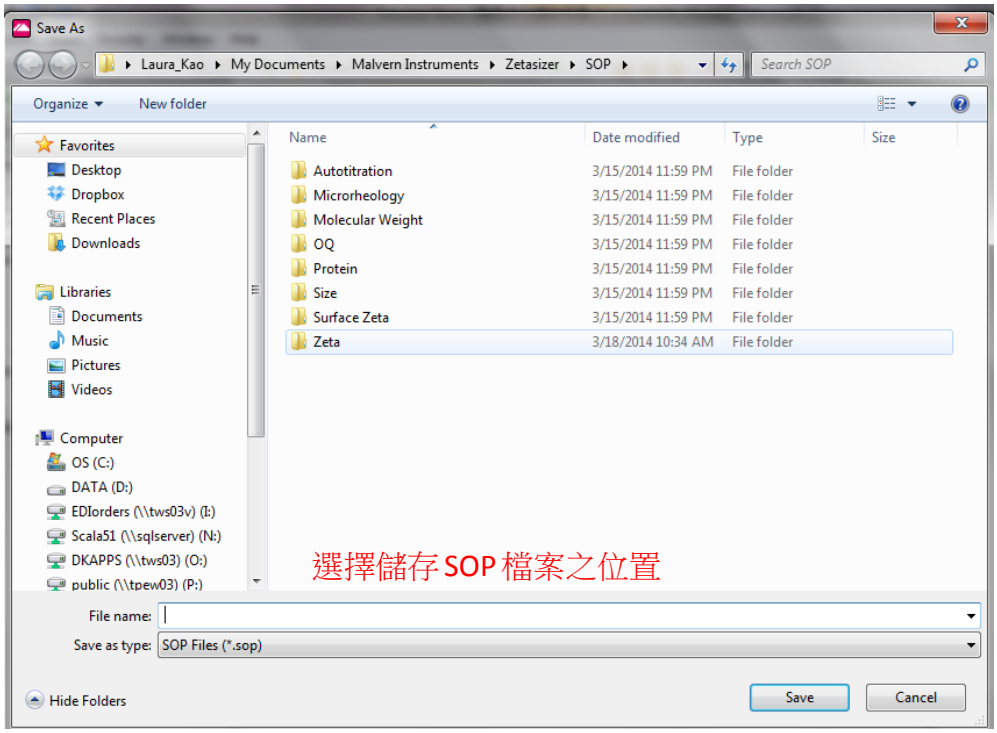
八、 SOP 設定

1. File > New > SOP… 或點選畫面上小圖示開始設定

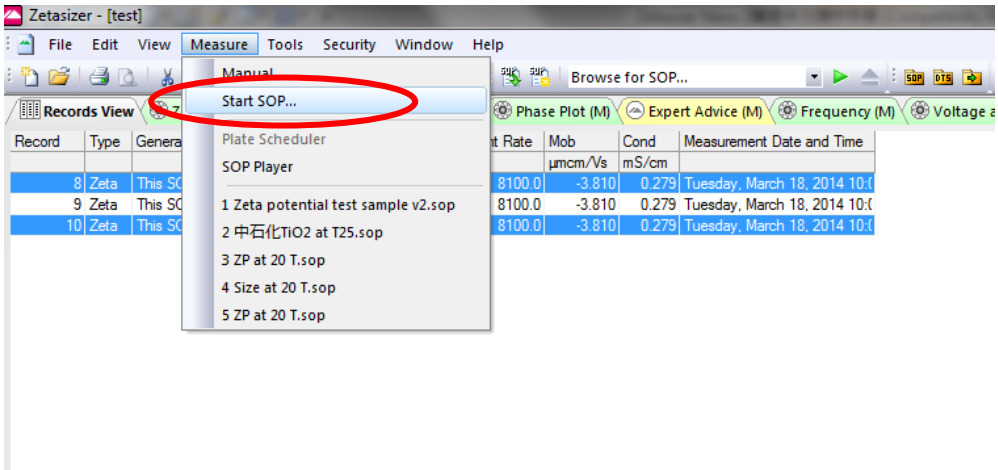


2. 設定參數

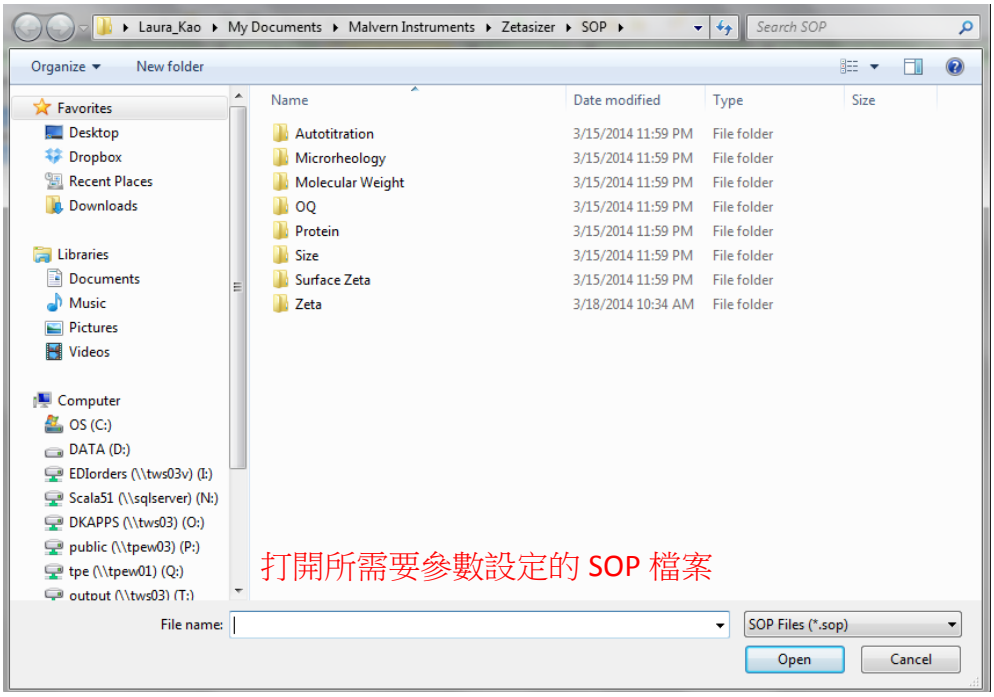
3. 選擇儲存路徑 > 設定檔名 > Save



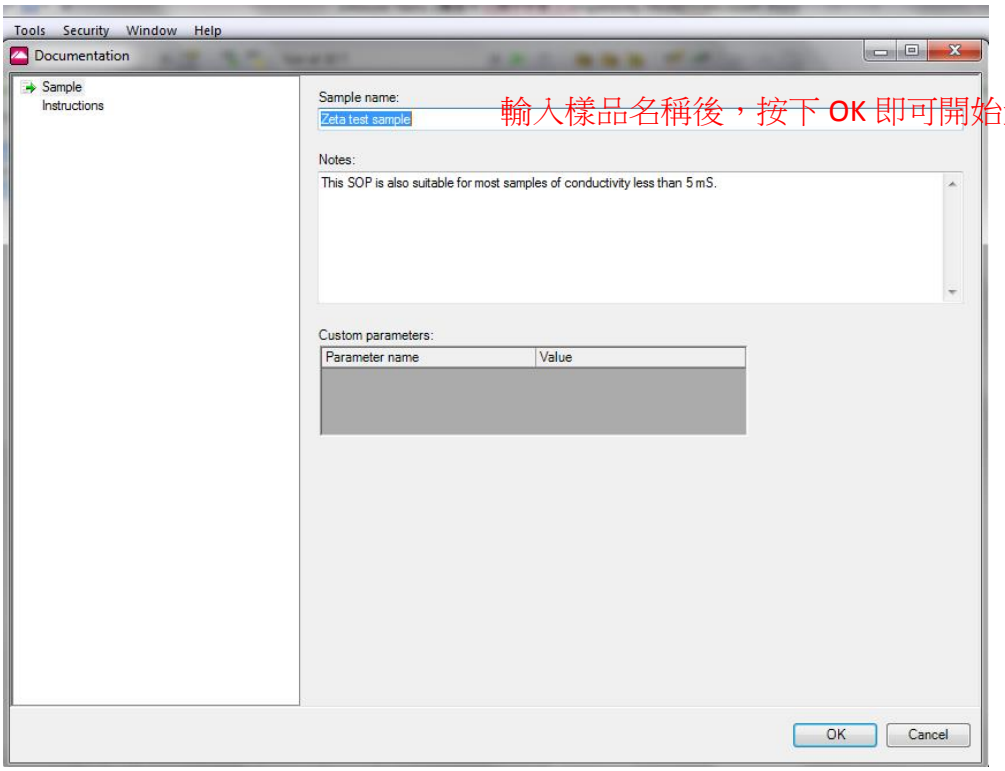
4. 使用 SOP 量測時，點選” Start SOP”



5. 打開 SOP 檔案



6. 輸入 Sample Name > OK



九、 標準樣品配置

1. Size standard：

A. 配備需求

a)0.92% w/v NaCl 溶液 10ml

b)超純水或二次去離子水 100ml

c) 125ml 塑膠燒杯

d)拋棄式粒徑分析樣品室 & 蓋子

e)0.2μm 注射器用濾膜

f) Duke 60nm Latex 標準品

B. NaCl 溶液製備

a. 將所有容器及工具先以超純水或二次去離子水潤洗過，注意不要使用任何形式的清潔劑清洗以免有殘留或汙染，用面紙擦乾燒杯後用大量超純水或二次去離子水充分沖洗乾淨。

b. 以下步驟如果可以最好在無塵抽氣櫃中操作，取 7ml NaCl 溶液稀釋至 100ml 的超純水或二次去離子水中。

C. 稀釋 60nm Latex 標準品

a) 以下步驟如果可以最好在無塵抽氣櫃中操作。

b) 潤洗 0.2μm 注射器用濾膜，以塑膠注射筒吸取超純水或二次去離子水 20ml，裝上 0.2μm 的注射器用濾膜，將超純水或二次去離子水過濾後排掉。

c) 吸取 5ml 稀釋後的 NaCl 溶液，以潤洗過的 0.2μm 注射器用濾膜過濾至一小瓶子中，沖洗過小瓶子後將溶液倒掉。

d) 重覆 b~c 步驟另外 2 次。

e) 確認 60nm Latex 標準品瓶口及瓶頸部分無乾燥結塊的膠體附著。排掉第一滴標準品後，滴 4 滴 Duke 60nm Latex 標準品於潤洗過的小瓶子中。

f) 以潤洗過的 0.2μm 注射器用濾膜過濾 20ml 稀釋過的 NaCl 溶液至步驟 e.的小瓶子。

g) 配製好的稀釋標準品應為透明清澈略帶青藍色調，在配好的樣品外瓶貼上註明粒徑尺寸範圍、配製日期的標籤。

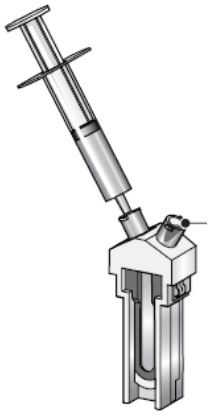
h) 以潤洗過的 0.2μm 注射器用濾膜過濾 1.5ml 稀釋過的 NaCl 溶液至乾淨的拋棄式粒径分析樣品室，蓋上蓋子後搖晃清洗樣品室然後倒掉，重覆此步驟共 3 次。

i) 打開上蓋，裝入配製完成的標準品約 1.5ml，蓋上蓋子，若樣品中含氣泡，小心將氣泡排掉，可將樣品室置入儀器中上機分析。.

2. Zeta potential standard :

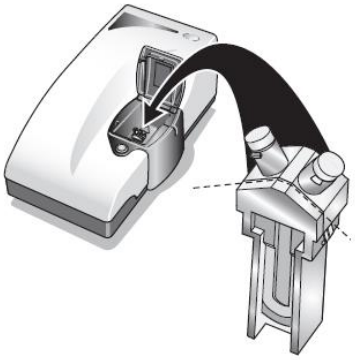
樣品：zeta potential standard of syringe -42±4.2mV

Zeta Cell 清洗方法：先用酒精將 zeta potential cell rinse，再用 DI water 清洗後，將液體排空晾乾備用。



將 standard 打入 cell 中

確認 cell 中不可有氣泡，將塞子塞住



將 cell 放儀器中準備量測

請注意：cell 放置有方向性

十、　注意事項

1. 實驗前 30mins 開啟儀器等待氣體雷射穩定為最佳
2. 開機時，先開儀器，再開軟體
3. 關機時，先關軟體，再關儀器
4. 開機時，燈號為綠紅相間，連接軟體後呈現綠燈，若出現紅燈表示儀器異常請連絡廠商
5. 放入樣品室時，請勿將樣品填入過量，溢出至槽內造成清洗困難，嚴重者需將儀器送回原廠保養
6. 移動儀器時，請小心輕放，勿用力擺放或撞擊，造成雷射光光學路經偏差
7. 請確定電源插座需有接地，避免電子設備故障