

表 3-1 金、硫及矽的光離子化截面積值及其特定軌域束縛能

	Au	S	Si
軌域	4d , 4f	2s , 2p	2s , 2p
Cross-section	0.2739 , 0.2511	0.01941 , 0.02265	0.01303 , 0.01112
軌域	$4d_{3/2} - 4d_{5/2}$ , $4f_{5/2} - 4f_{7/2}$	2s , $2p_{1/2} - 2p_{3/2}$	2s , 2p
束縛能 eV	353 - 335 , 87.7 - 84	228 , 165 - 164	151 , 99

資料來源 : a. Atomic Calculation of Photoionization Cross Sections and

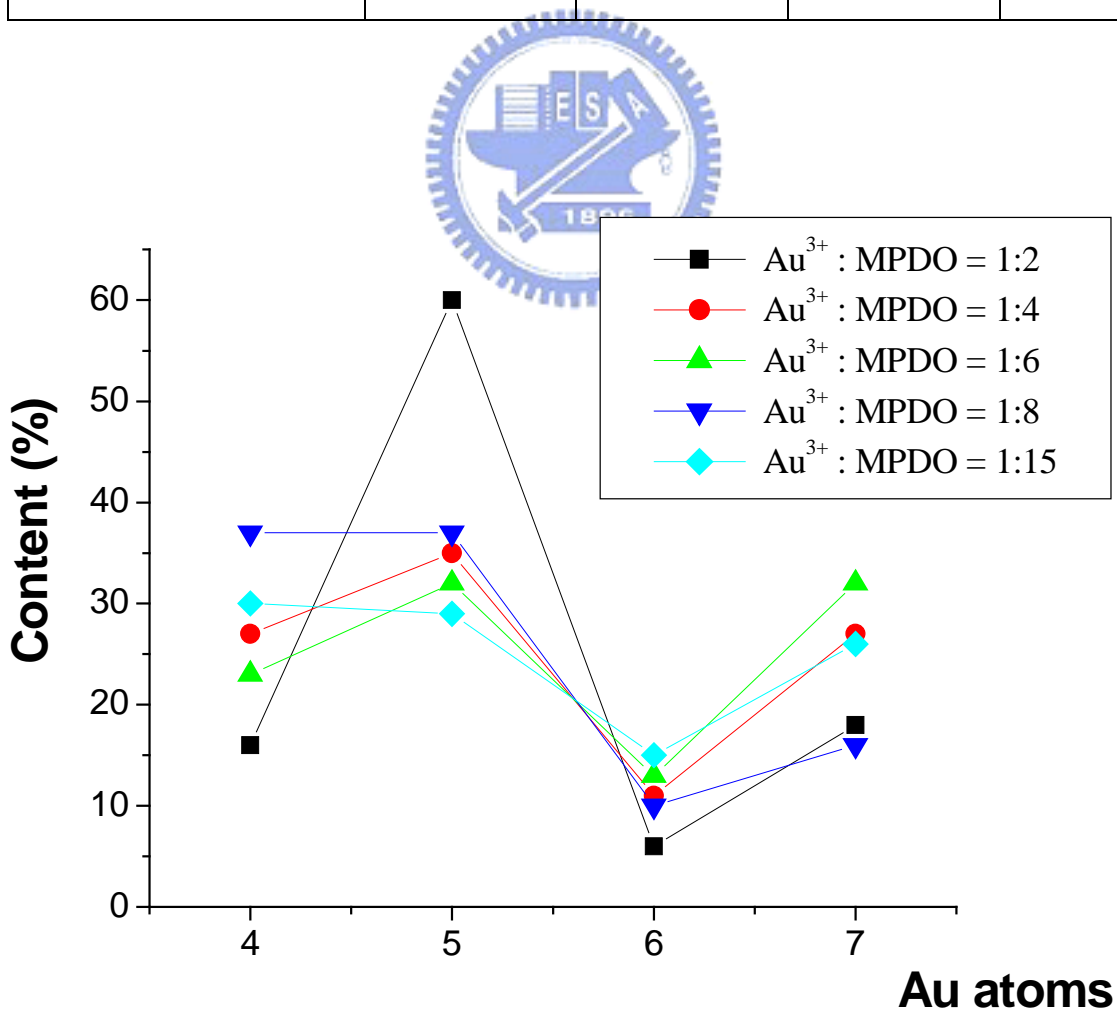
Asymmetry Parameters<sup>(38)</sup>

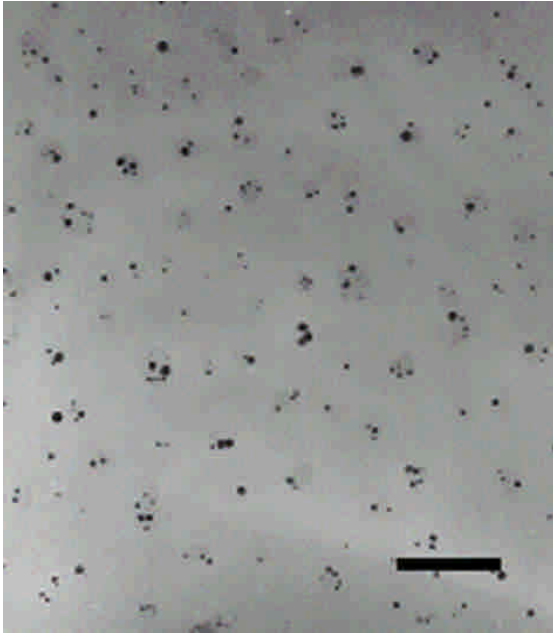
b. Handbook of X-ray Photoelectron Spectroscopy<sup>(39)</sup>



表 3-2

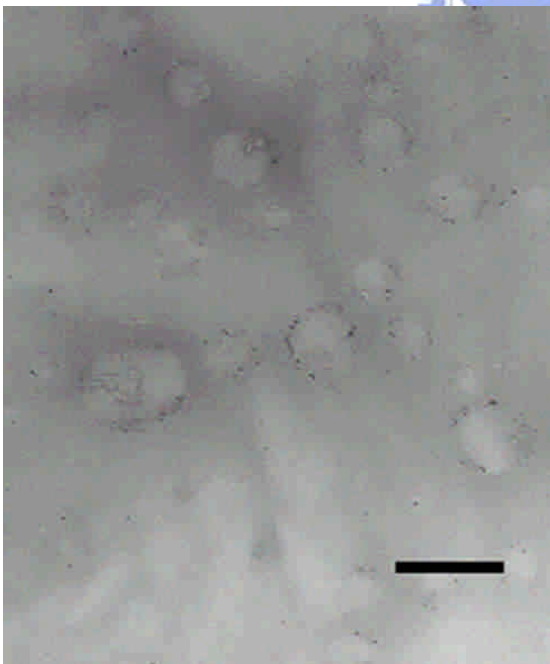
MPC 種類 合成條件	MPC 種類			
	Au <sub>4</sub> -MPC	Au <sub>5</sub> -MPC	Au <sub>6</sub> -MPC	Au <sub>7</sub> -MPC
Au <sub>3</sub> <sup>+</sup> : 2OH = 1 : 2	16%	60%	6%	18%
Au <sub>3</sub> <sup>+</sup> : 2OH = 1 : 4	27%	35%	11%	27%
Au <sub>3</sub> <sup>+</sup> : 2OH = 1 : 6	23%	32%	13%	32%
Au <sub>3</sub> <sup>+</sup> : 2OH = 1 : 8	37%	37%	10%	16%
Au <sub>3</sub> <sup>+</sup> : 2OH = 1 : 15	30%	29%	15%	26%





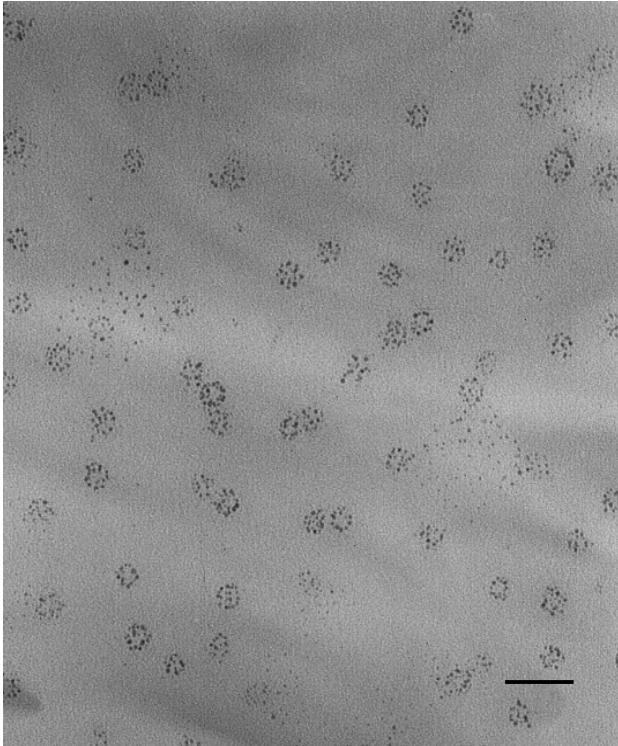
Scale Bar =125 nm

圖 3-1 PS-P4VP(P229) +  $\text{HAuCl}_4 \cdot 4\text{H}_2\text{O}$  (Au:PVP=1:1 molar ratio) 以六倍當量的  $\text{N}_2\text{H}_4 \cdot \text{H}_2\text{O}$  還原後的穿透式電子顯微鏡照片



Scale Bar =150 nm

圖 3-2 PS-P4VP(P229) +  $\text{HAuCl}_4 \cdot 4\text{H}_2\text{O}$  (Au:PVP=1:1 molar ratio) 以六倍當量的  $\text{LiB}(\text{Et})_3\text{H}$  (1M in THF) 還原後的穿透式電子顯微鏡照片



Scale Bar = 50 nm

圖 3-3 PS-P4VP(P229) +  $\text{HAuCl}_4 \cdot 4\text{H}_2\text{O}$  (Au:PVP=1:1 molar ratio) 以六倍當量的  $\text{NaBH}_4$  還原後的穿透式電子顯微鏡照片



圖 3-4 (a) 在日光燈照射下的 Au-2OH MPC 溶液

(b) 紫外光燈照射下的 Au-2OH MPC 溶液

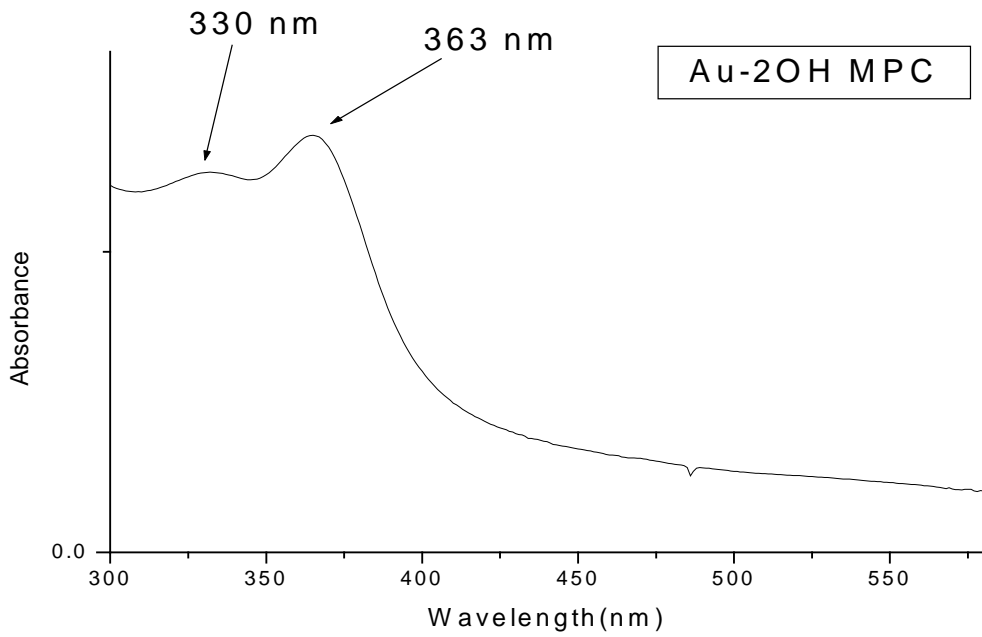


圖 3-5 用方法二， $\text{Au}_3^+ : 2\text{OH} = 1 : 6$  莫耳比下合成出的 Au-2OH MPC 的紫外光-可見光(UV-Vis)吸收光譜圖

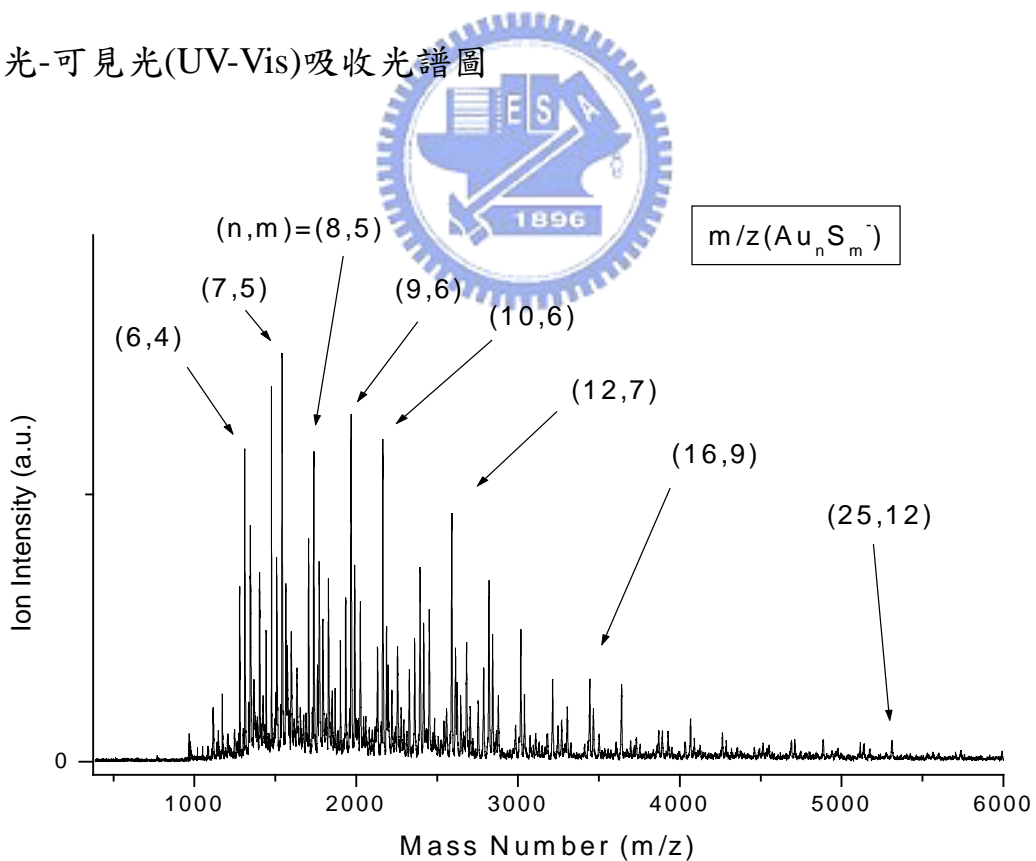


圖 3-6 用方法二， $\text{Au}_3^+ : 2\text{OH} = 1 : 6$  莫耳比合成出的 Au-2OH MPC 的 MALDI 質譜圖

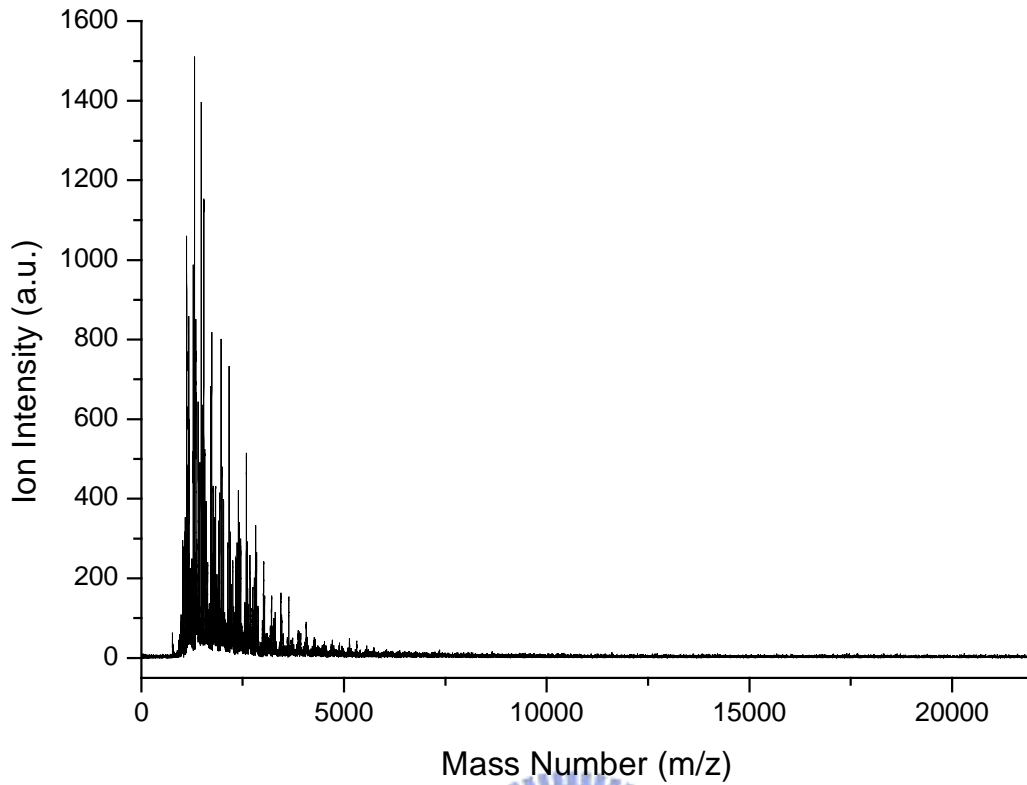


圖 3-7 用方法二， $\text{Au}_3^+ : 2\text{OH} = 1 : 6$  莫耳比合成出的 Au-2OH MPC 的 MALDI 質譜圖，質量數訊號記錄至 22000 m/z

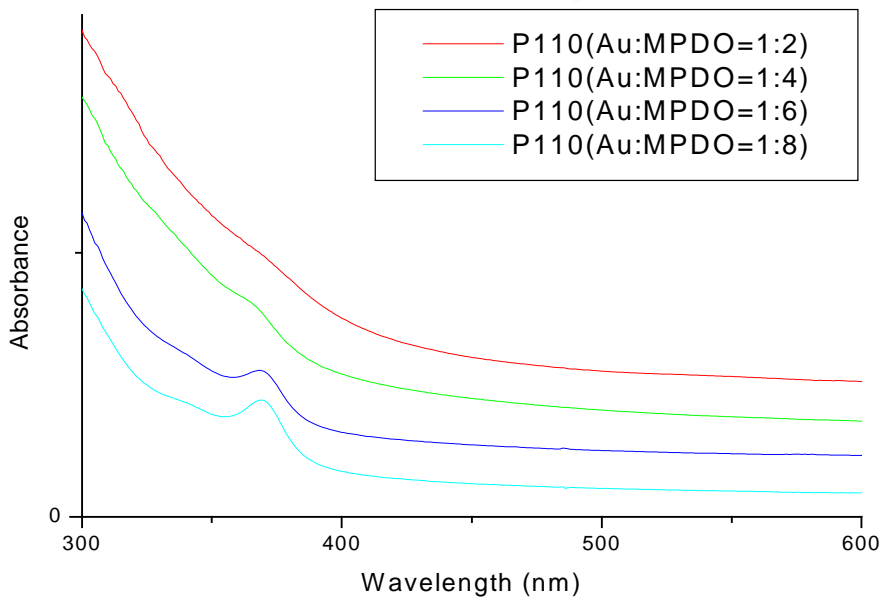
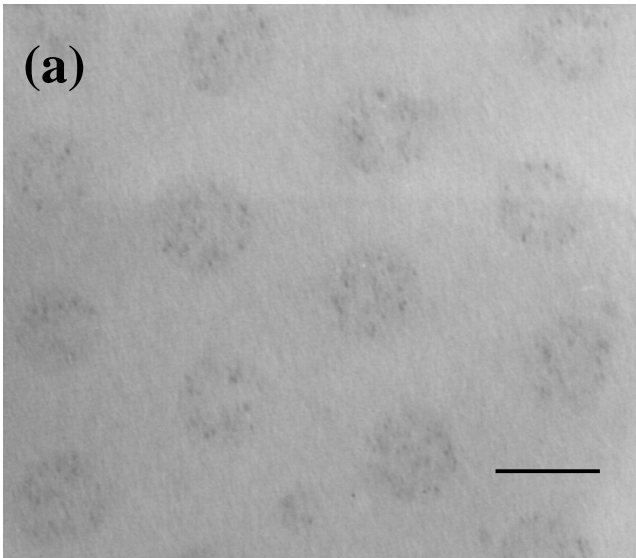
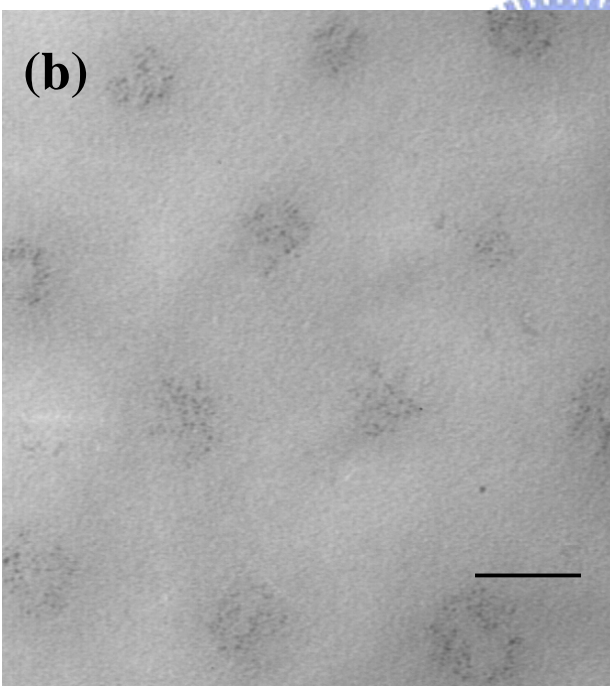


圖 3-8 Au-MPDO (1:x)/SVP-110(Tol)， $x = 2、4、6、8$  的 UV-Vis 吸收圖譜



Scale Bar = 50 nm

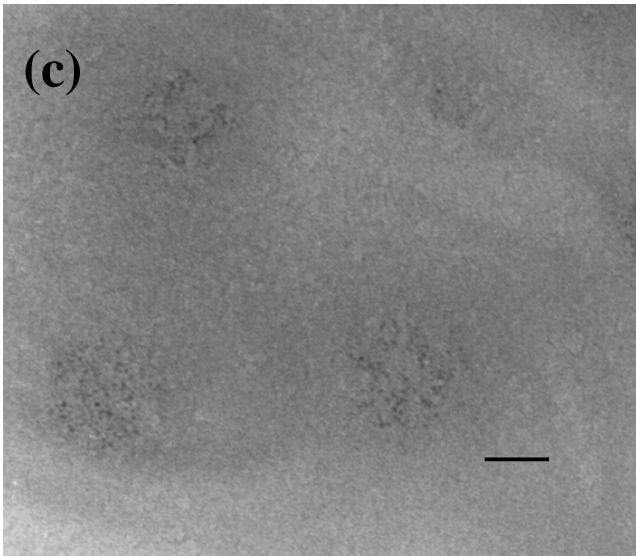


Scale Bar = 50 nm

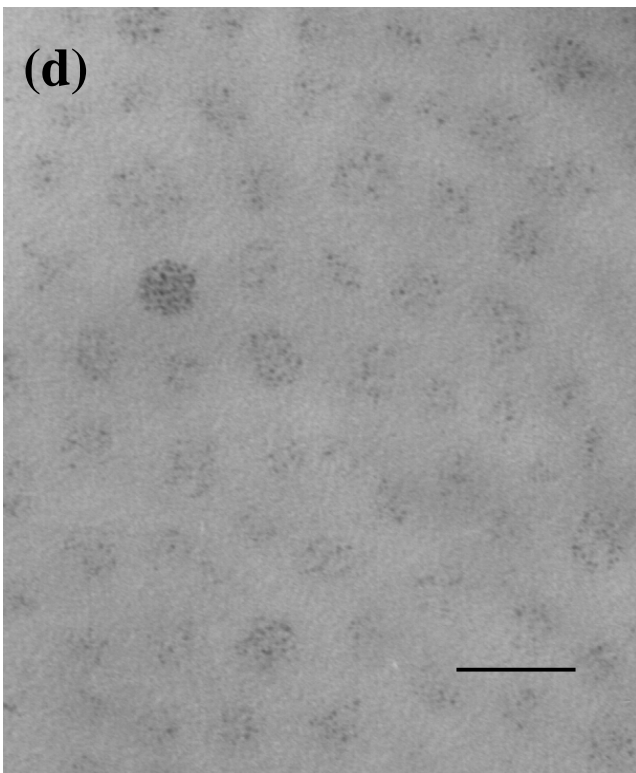
圖 3-9 (a) PS-P4VP(P252) + MPDO + H<sub>2</sub>AuCl<sub>4</sub>、

(b) Au- MPDO (1:2)/SVP-252(Tol)-100k 的 TEM 照片





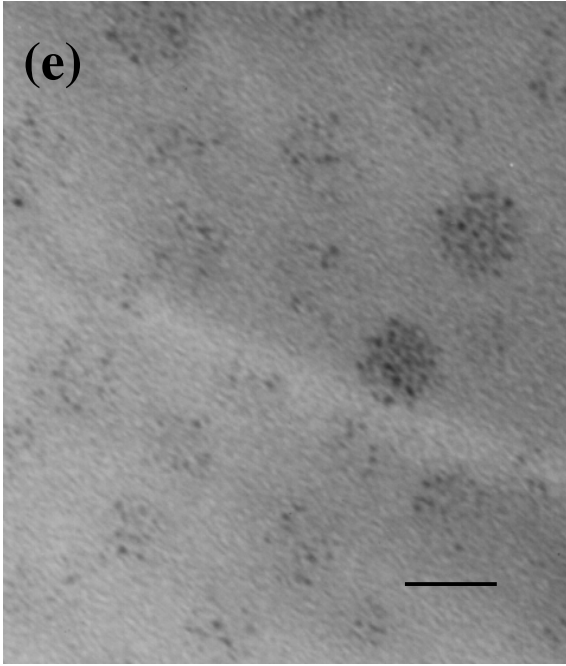
Scal Bar = 25 nm



Scal Bar = 50 nm

圖 3-9 (c) Au- MPDO (1:2)/SVP-252(Tol)-200k、

(d) Au- MPDO (1:2)/SVP-110(Tol)-100k 的 TEM 照片



Scale Bar = 25 nm

圖 3-9 (e) Au- MPDO (1:2)/SVP-110(Tol)-200k 的 TEM 照片



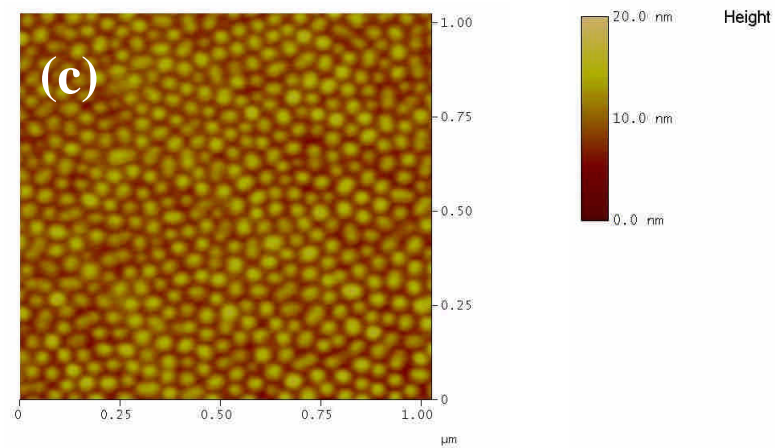
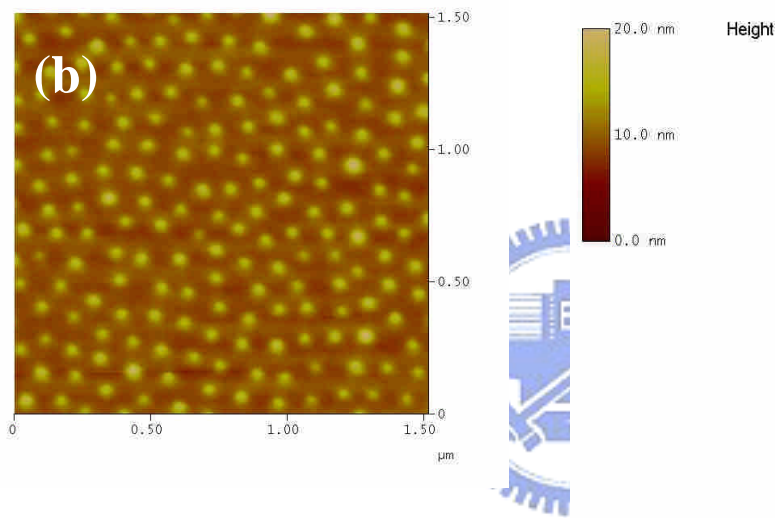
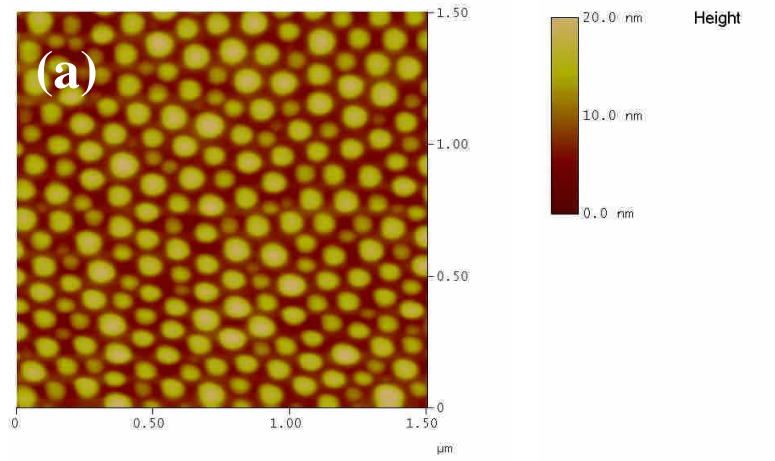


圖 3-10 (a) Au- MPDO (1:2)/SVP-252(Tol) 、(b) Au- MPDO

(1:2)/SVP-229(Tol) 、(c) Au- MPDO (1:2)/SVP-110(Tol) ， 的 AFM 圖

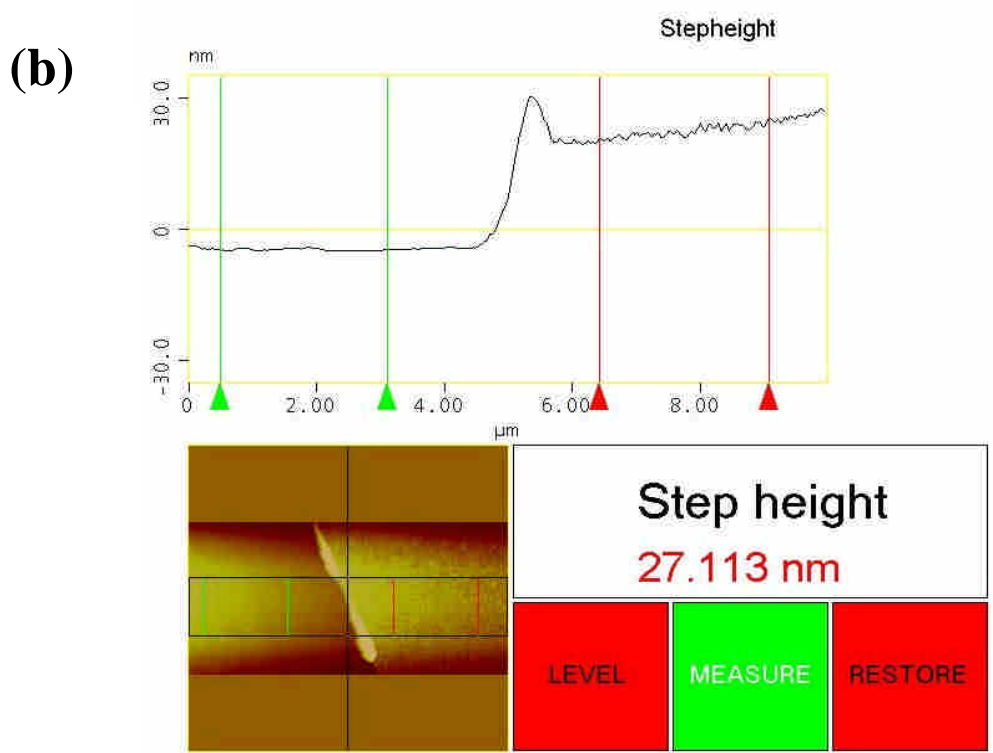
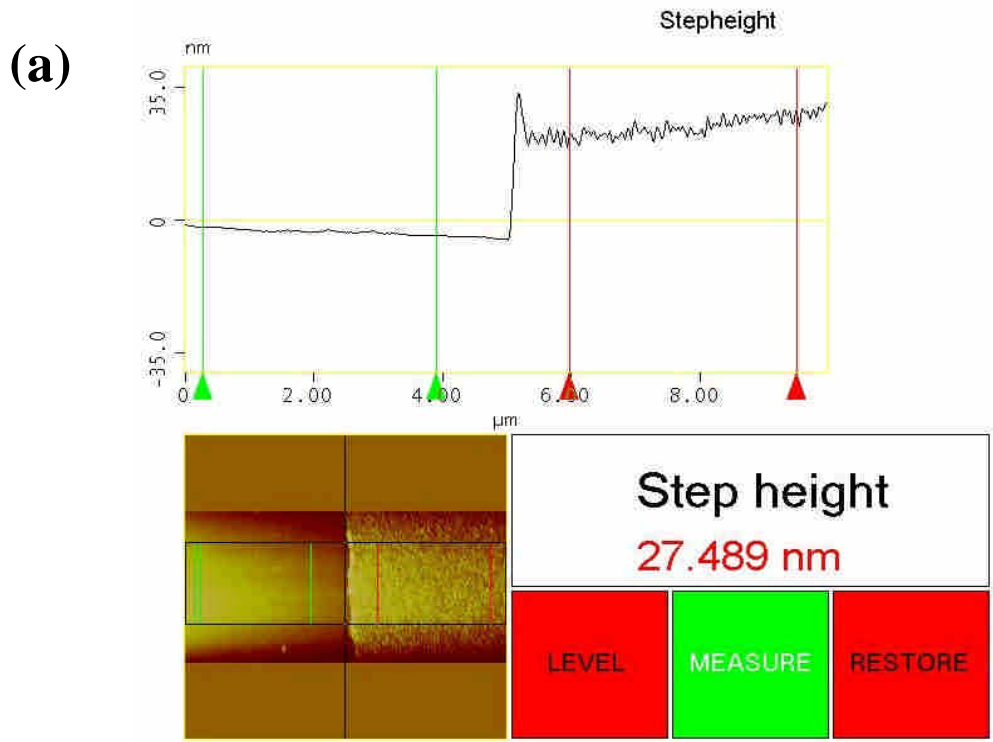


圖 3-11 以 AFM 量測(a) Au- MPDO (1:2)/SVP-252(Tol) 、(b) Au- MPDO (1:2)/SVP-110(Tol)膜厚。

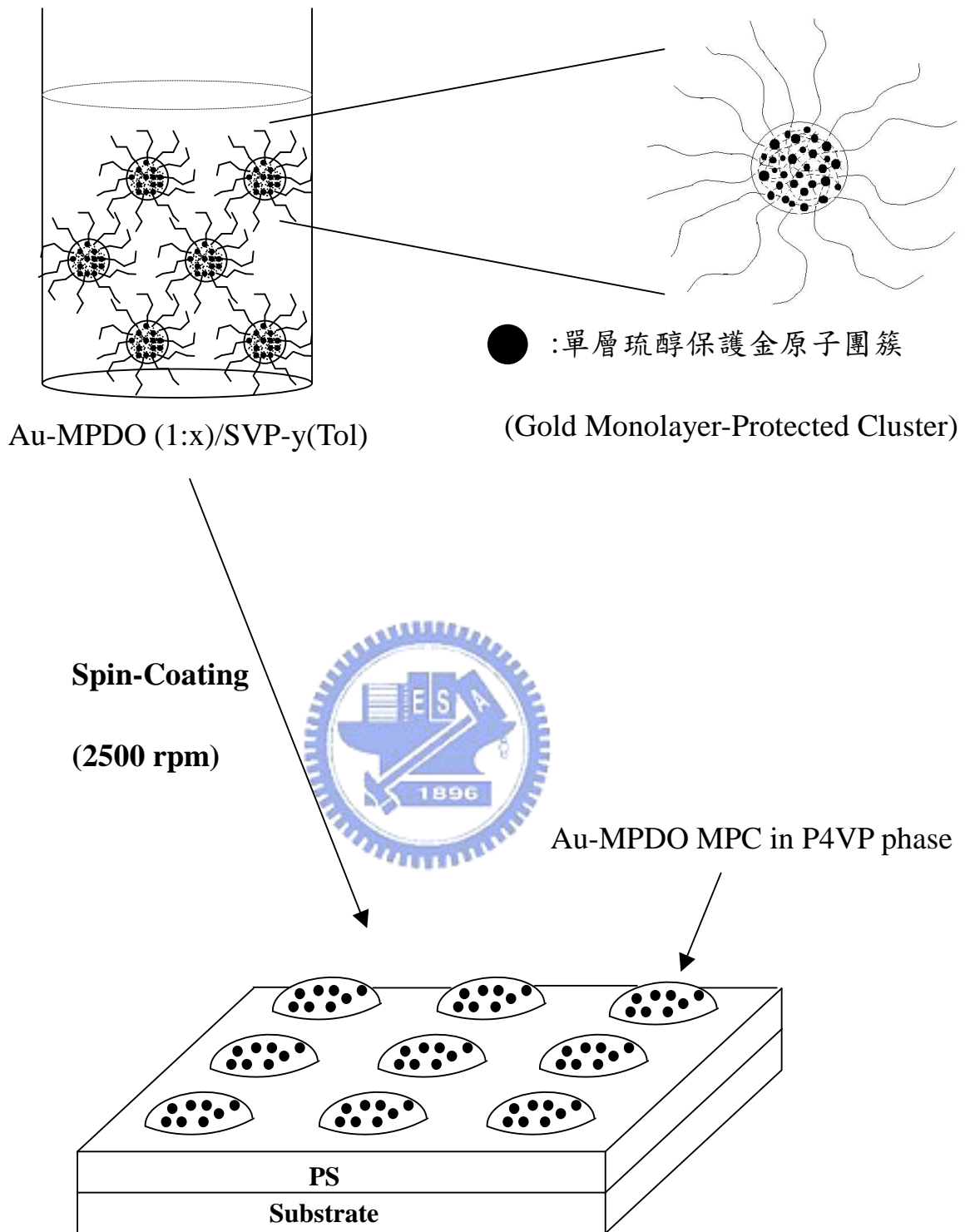


圖 3-12 Au-MPDO / SVP(Tol)微胞以旋轉塗佈的方式在基板上製備薄膜的示意圖

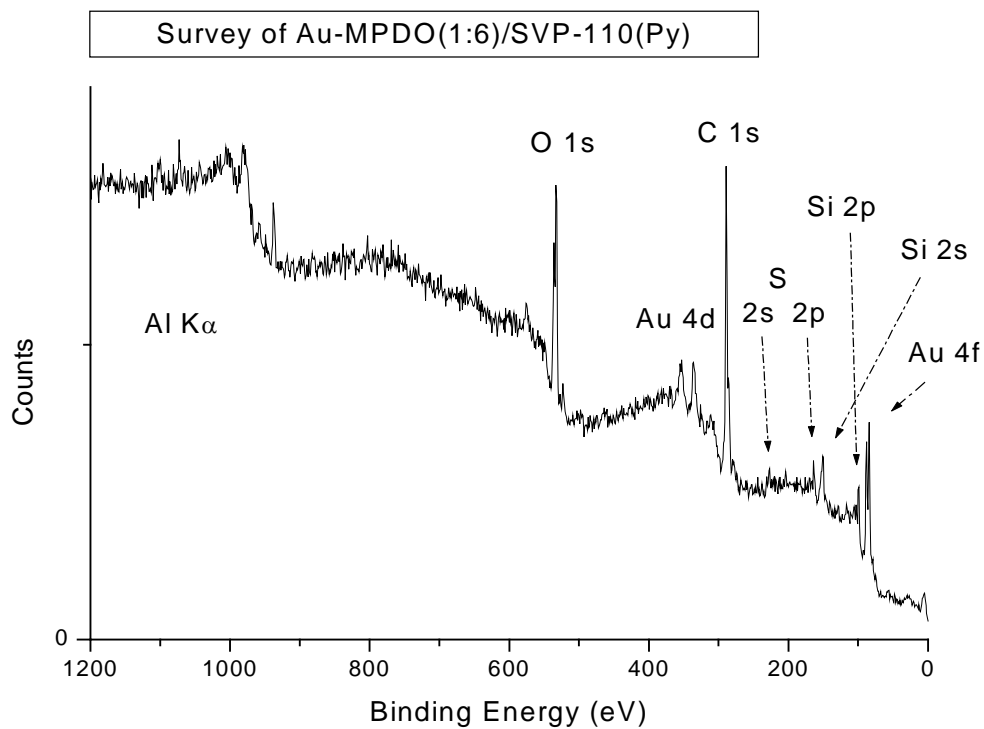


圖 3-13 Au-MPDO(1:6)/SVP-110(Py)的 ESCA 綜觀掃描(Survey Scan)圖譜

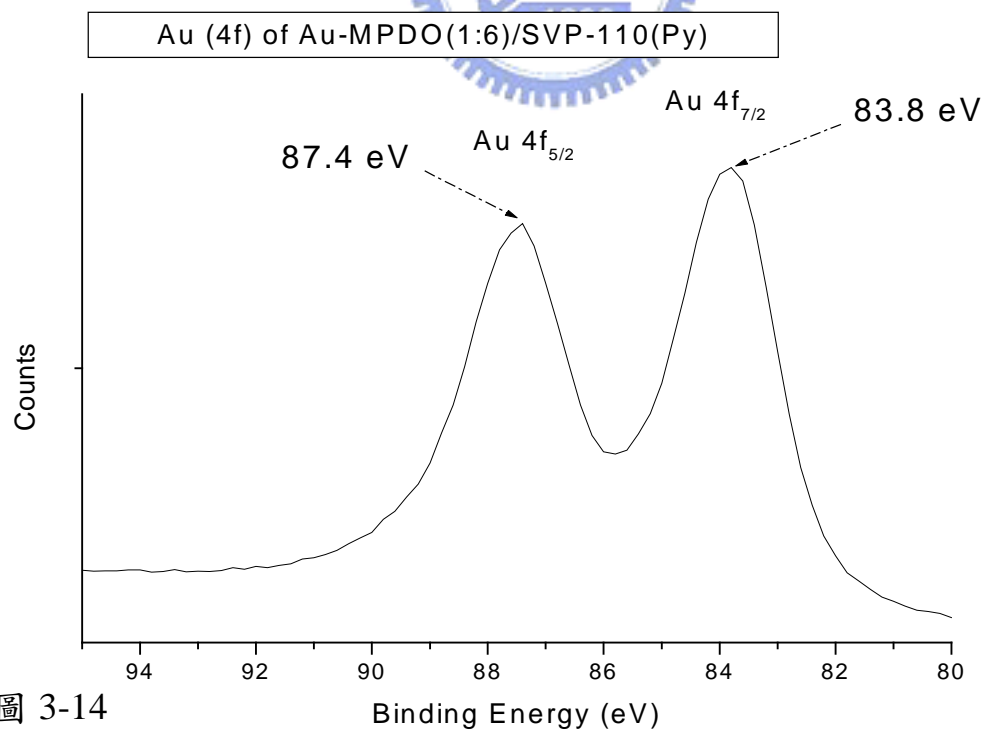


圖 3-14

Au-MPDO(1:6)/SVP-110(Py) 的 Au  $4f_{7/2}$  及  $4f_{5/2}$  軌域束縛能

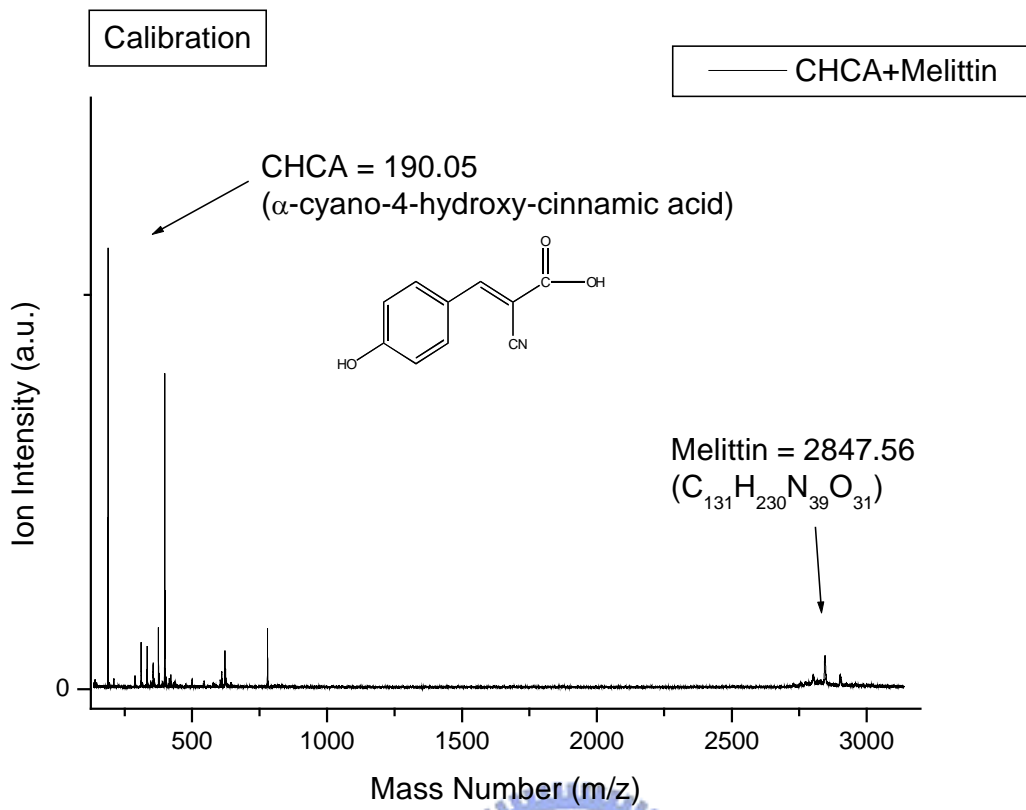


圖 3-15 CHCA 及 Melittin 的 MALDI 質譜，用以校正

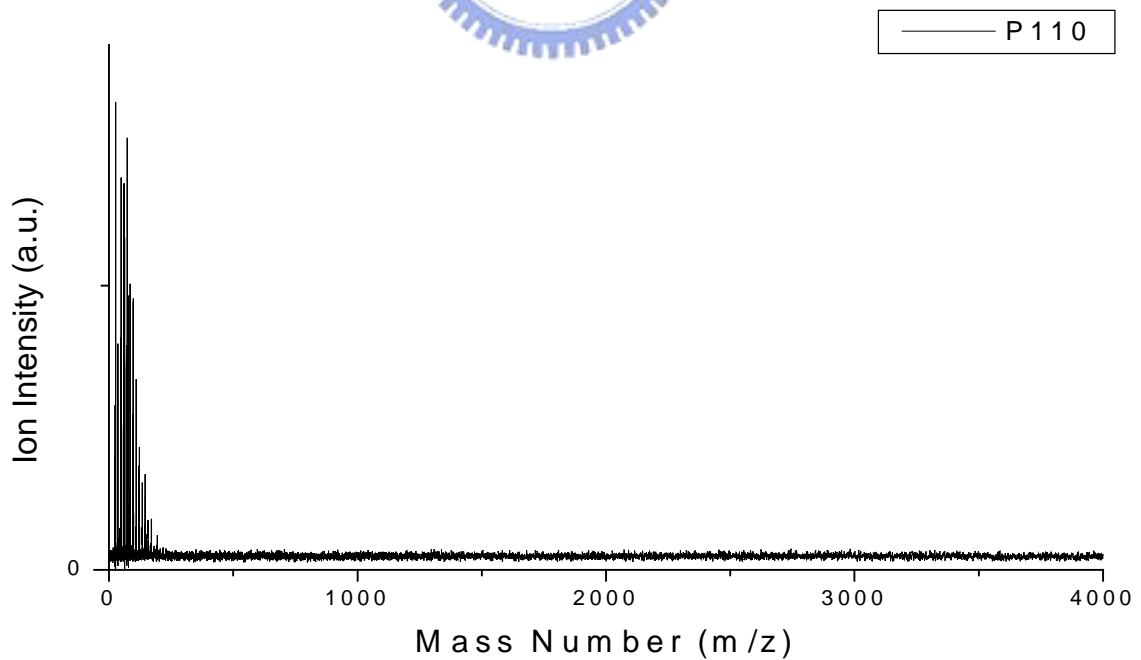
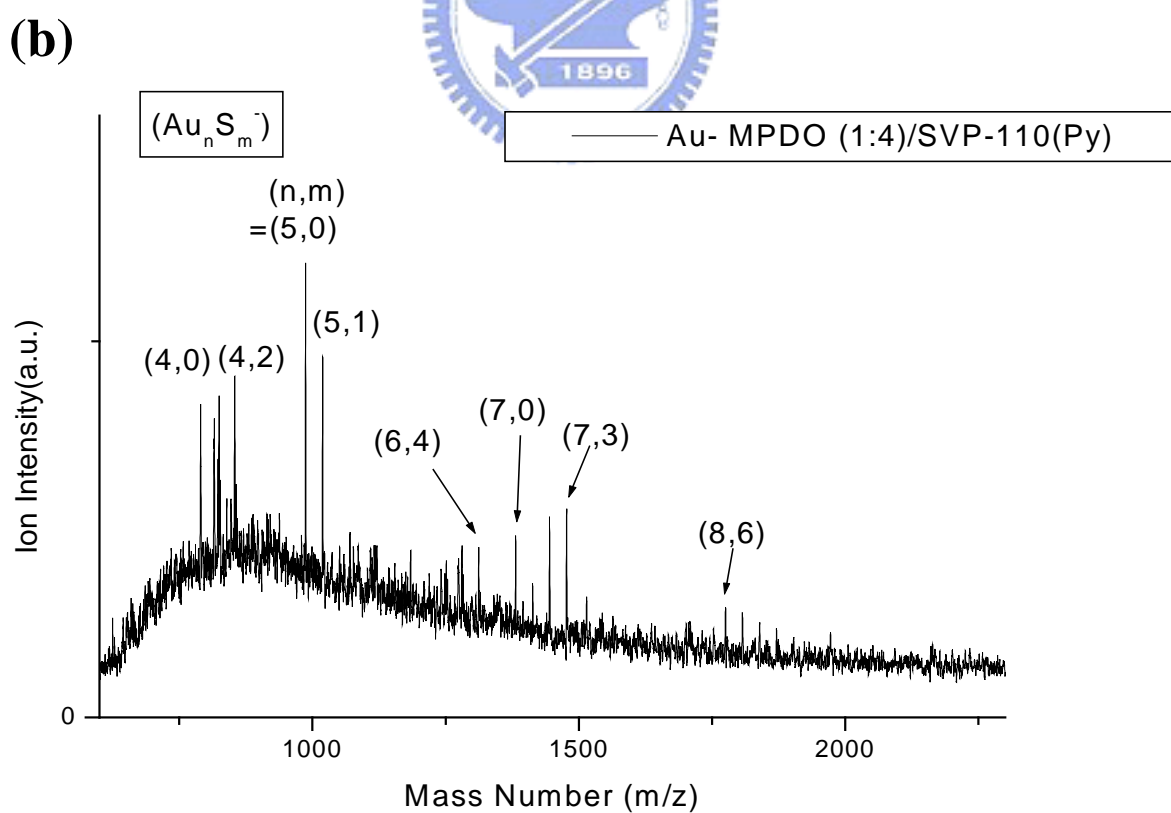
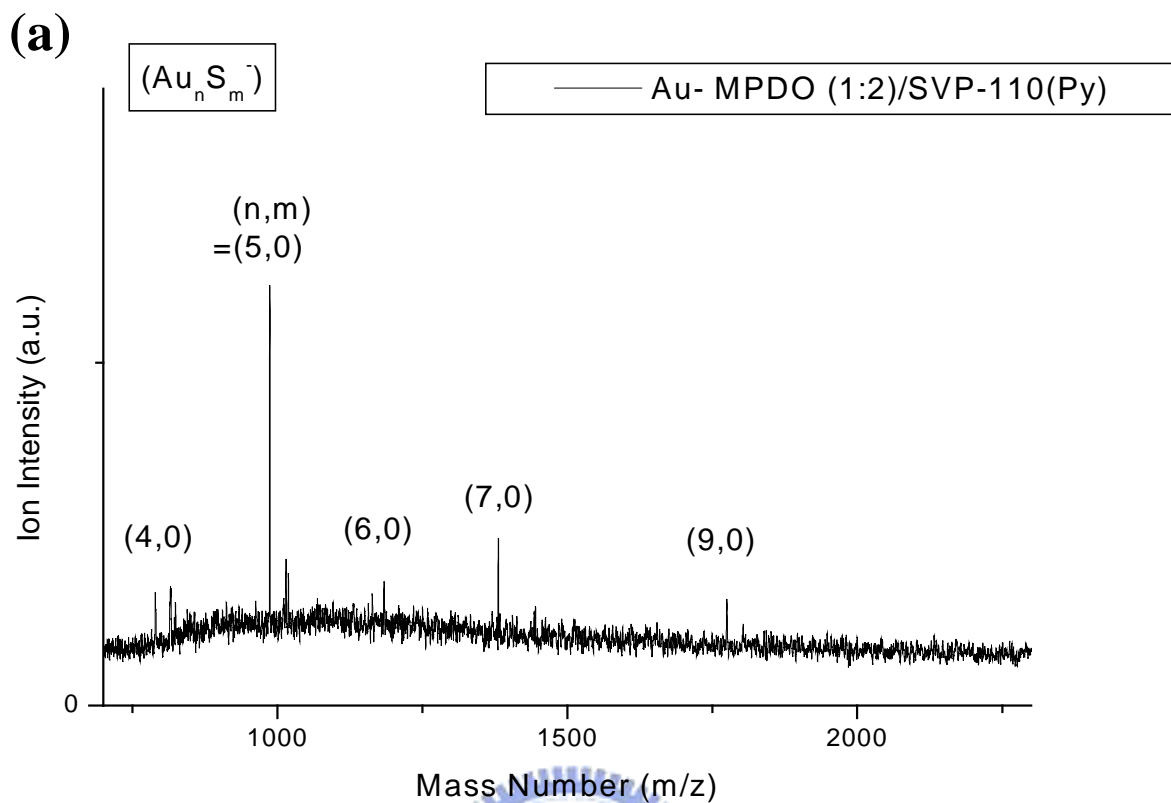
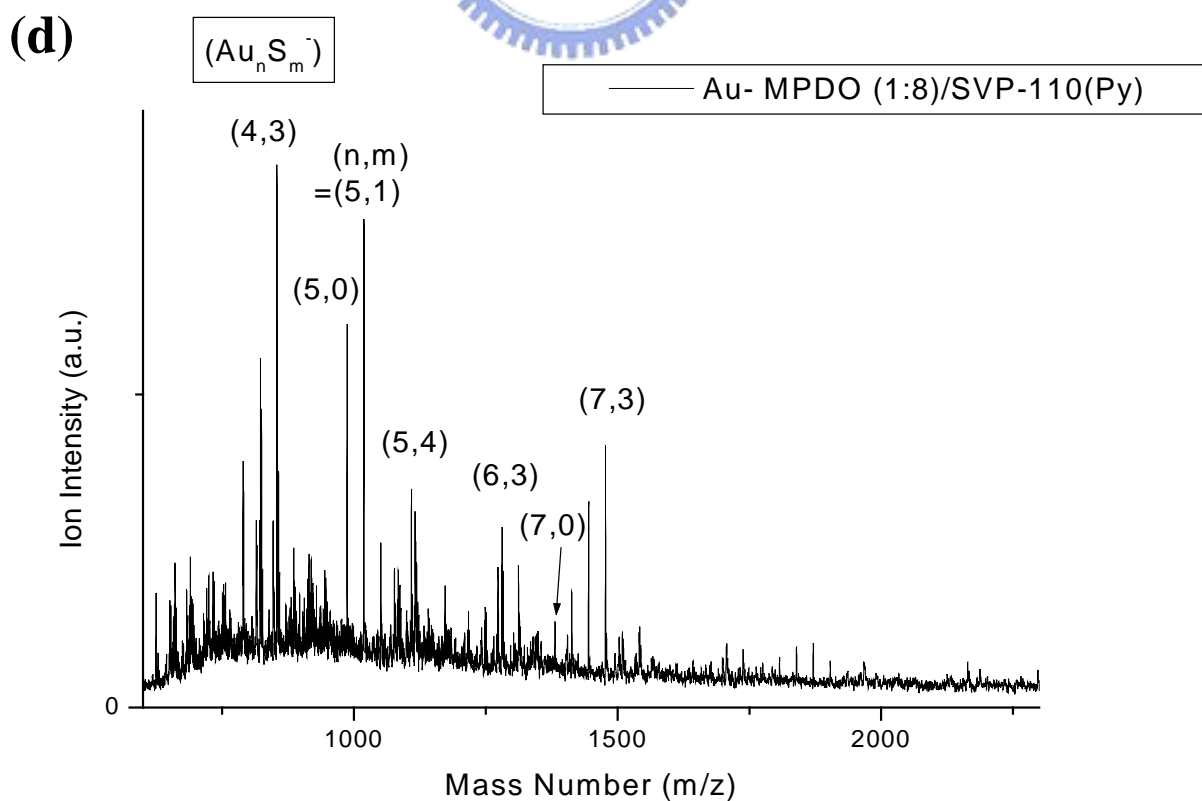
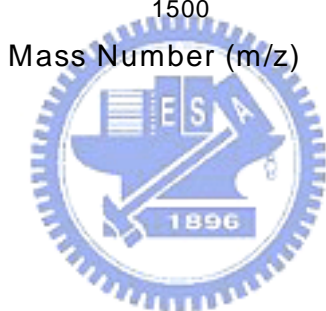
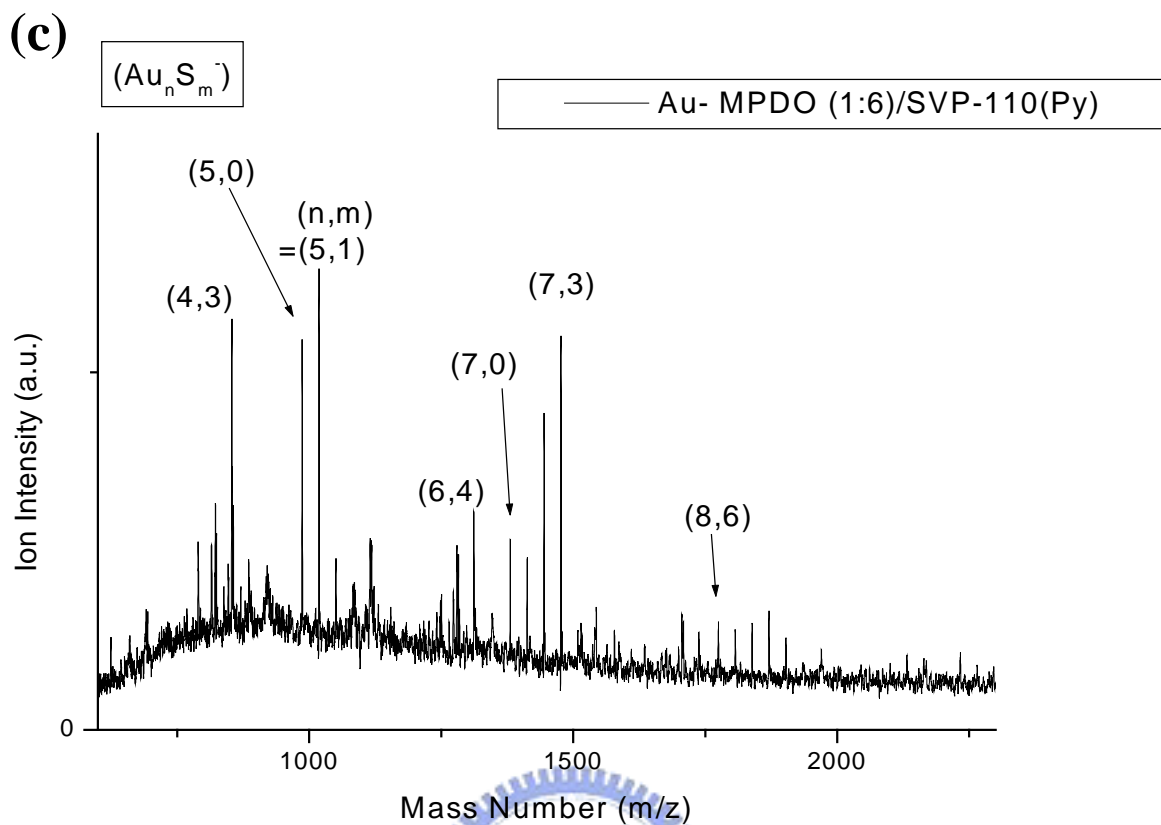


圖 3-16 P110 的 MALDI 質譜







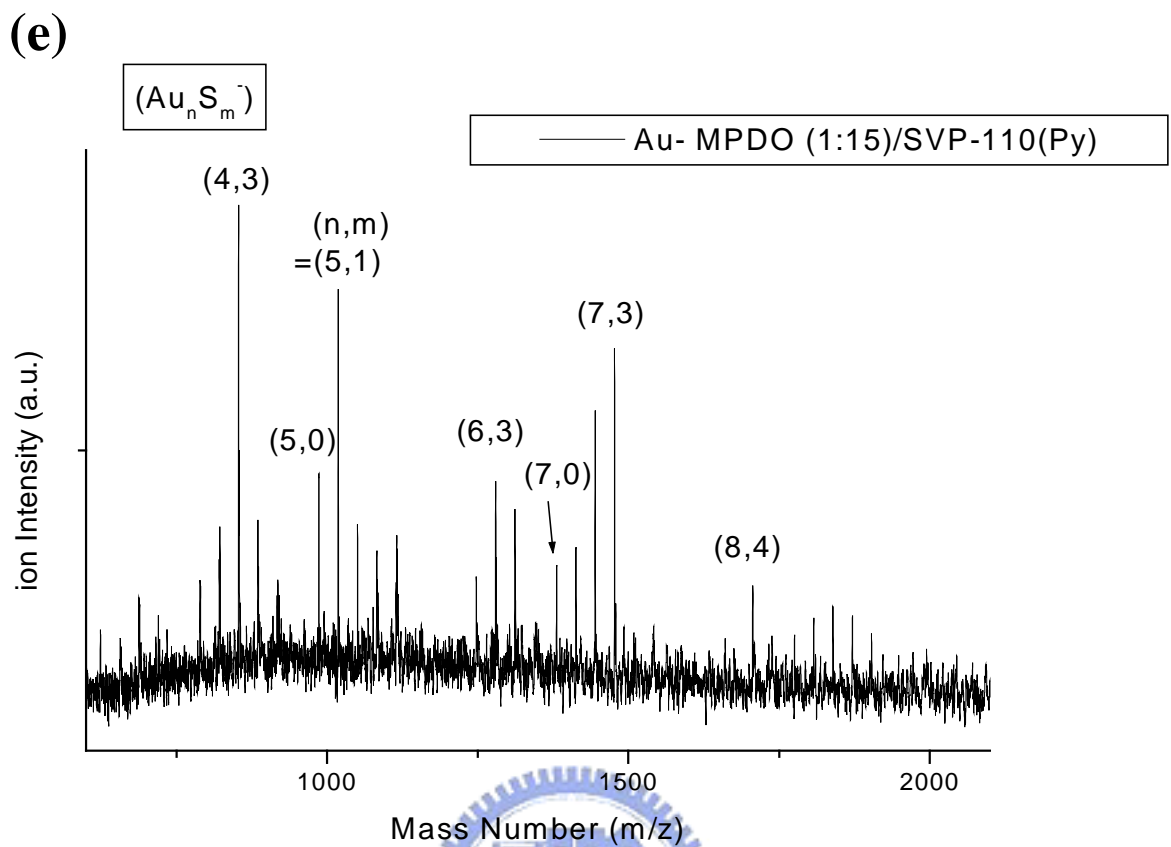


圖 3-17 Au- MPDO (1:x)/SVP-110(Py), x = (a) 2、(b)4、(c)6、(d)8、(e)15，  
五種樣品的 MALDI 質譜

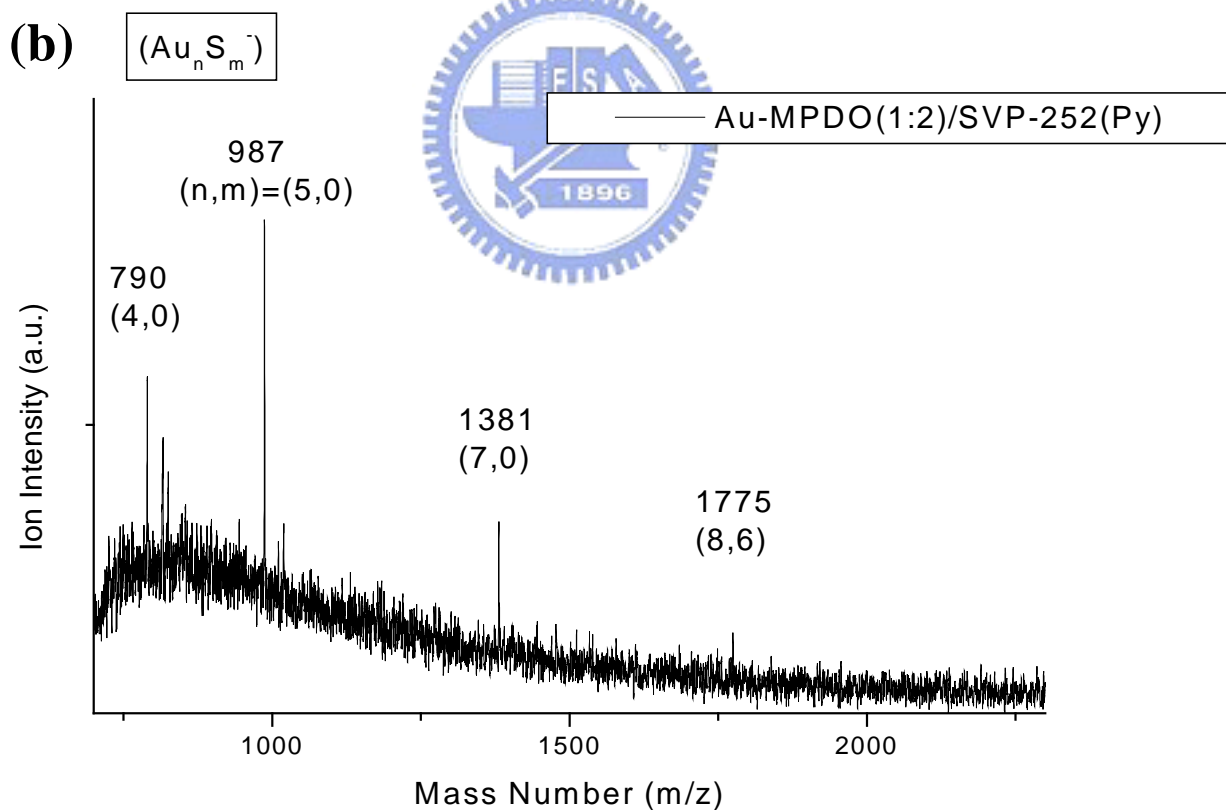
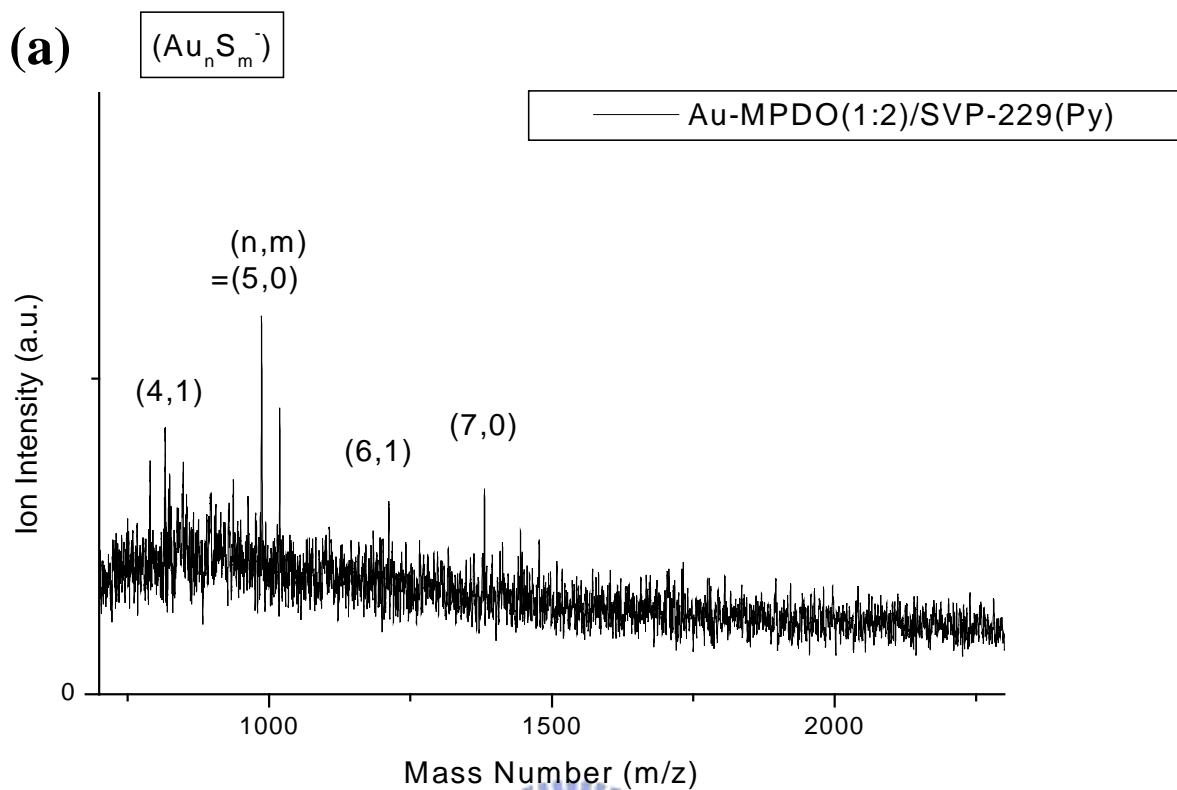


圖 3-18 (a) Au-MPDO(1:2)/SVP-229(Py),

(b) Au-MPDO(1:2)/SVP-252(Py) MALDI 質譜

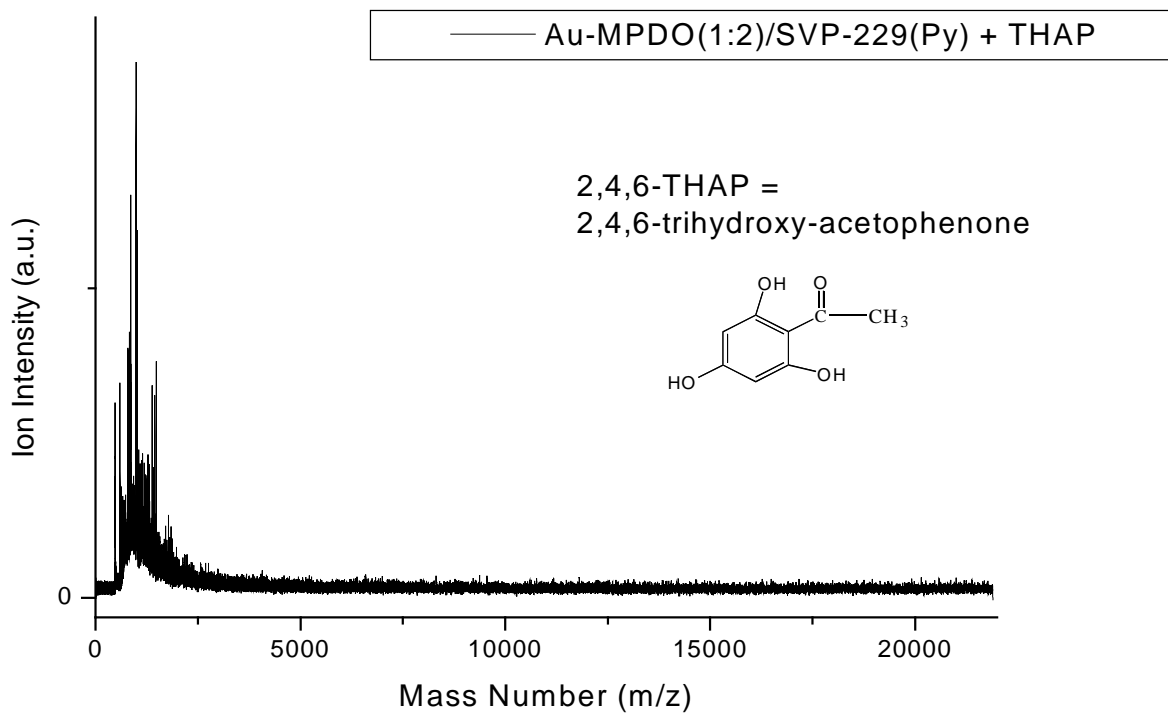
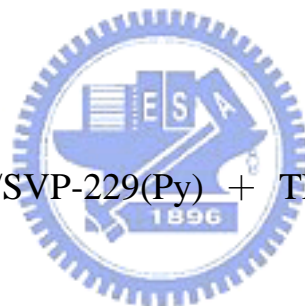


圖 3-19 Au-MPDO(1:2)/SVP-229(Py) + THAP 的 MALDI 質譜



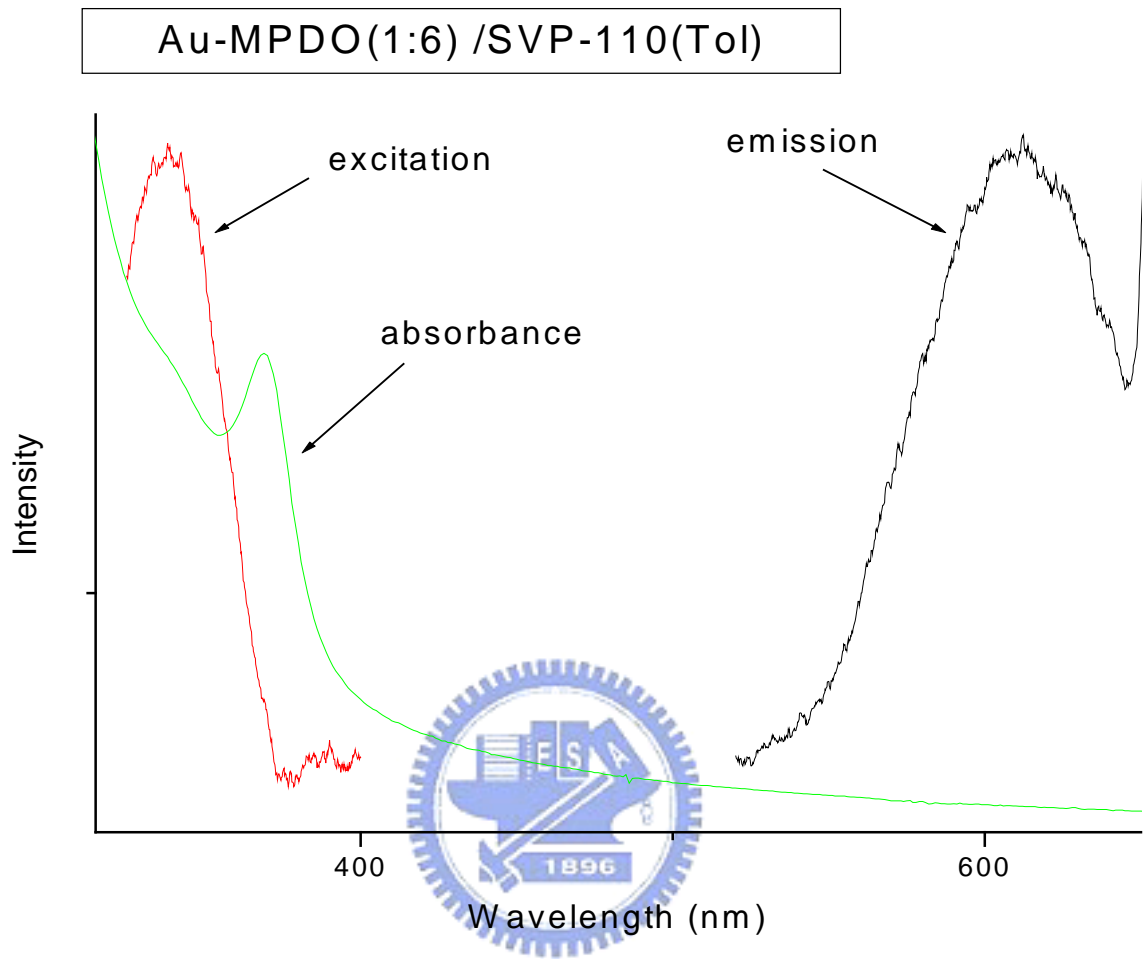


圖 3-20 Au-MPDO (1:6)/SVP-110(Tol)的 PL 圖譜與 UV-Vis 吸收圖譜

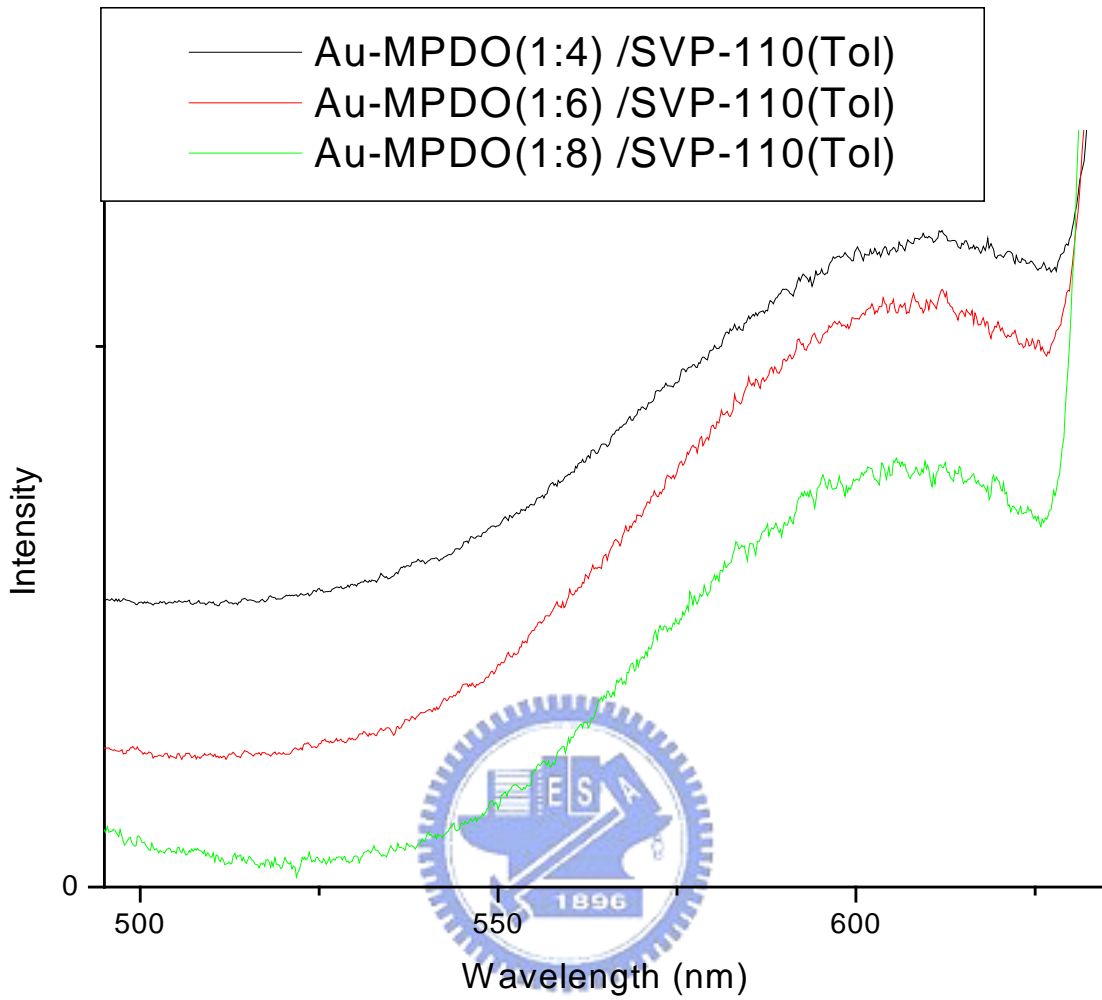


圖 3-21 Au-MPDO (1:4)/SVP-110(Tol) 、 Au-MPDO (1:6)/SVP-110(Tol) 、  
Au-MPDO (1:8)/SVP-110(Tol)三種樣品的 PL 圖譜

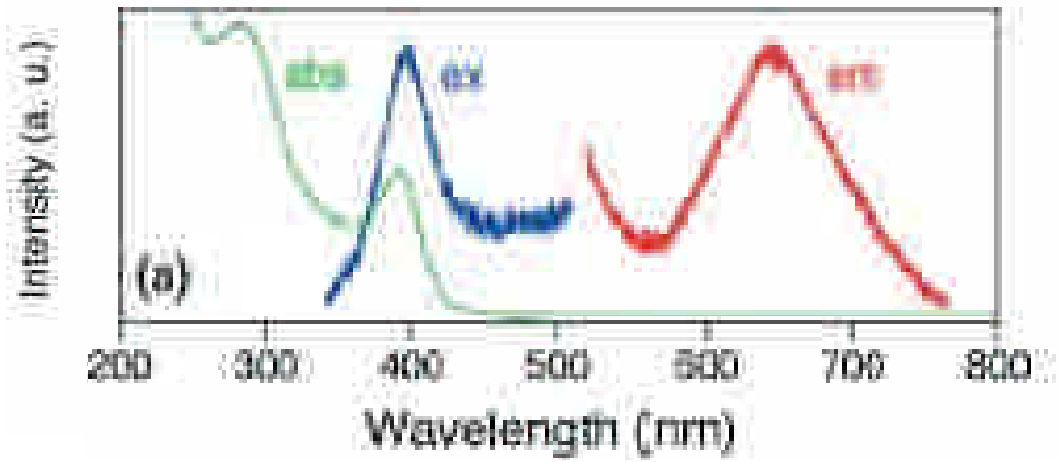


圖 3-22 以 meso-2,3-dimercaptosuccinic acid 為改質劑的 Au<sub>12</sub> MPC 的 PL 圖譜及 UV-Vis 吸收圖譜\*