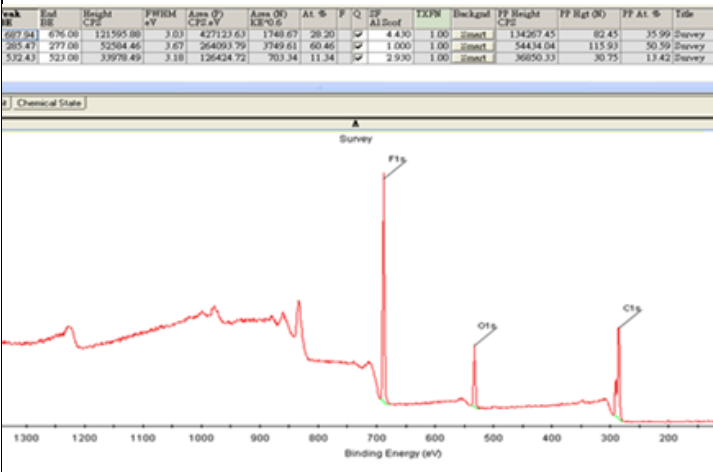
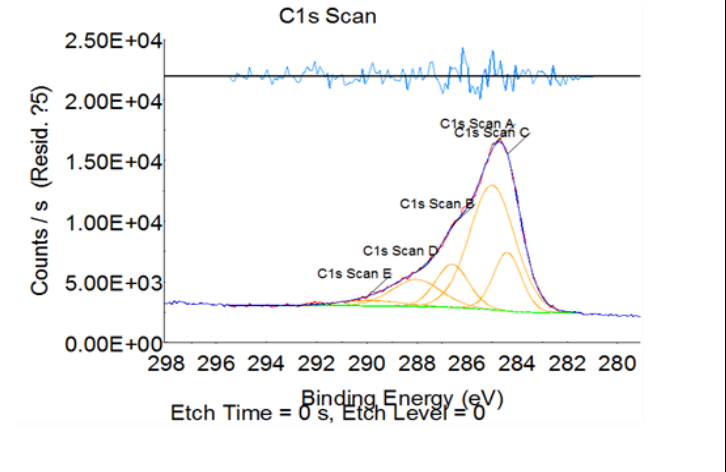
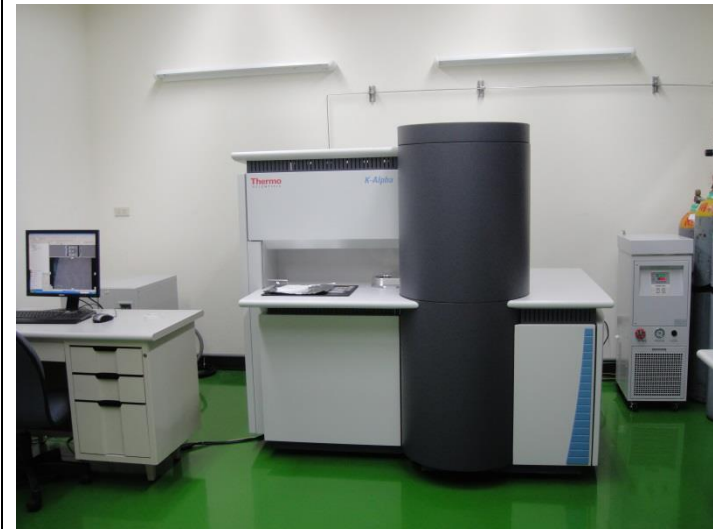
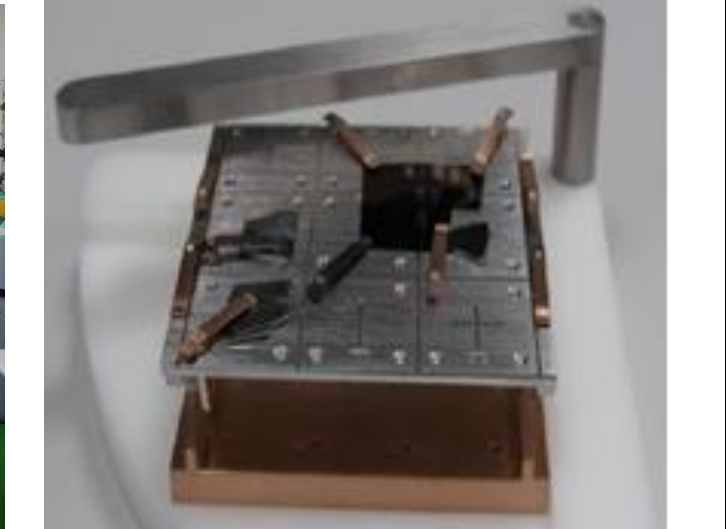
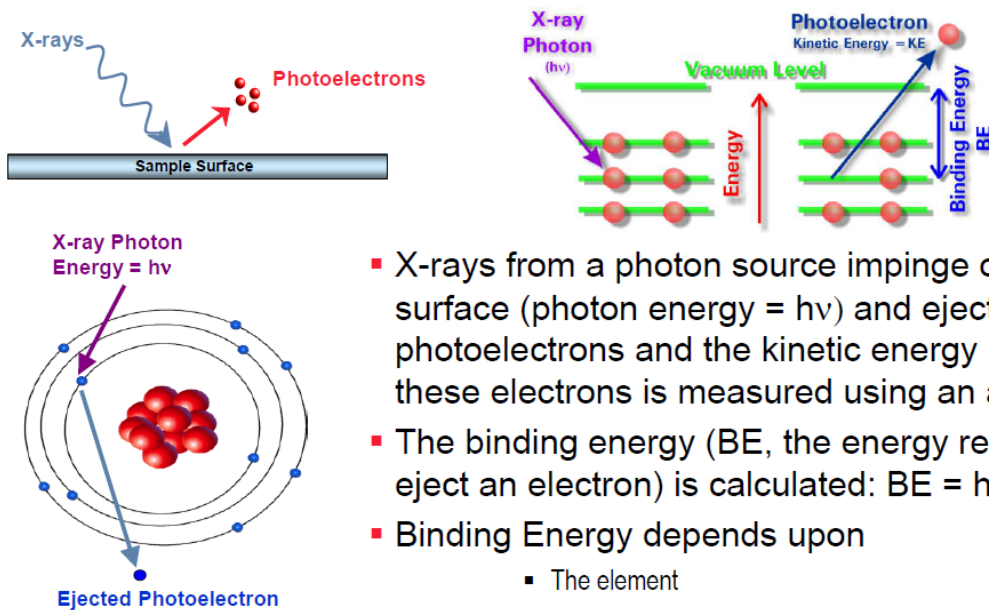


中原大學 薄膜中心 儀器簡介 - 1. XPS

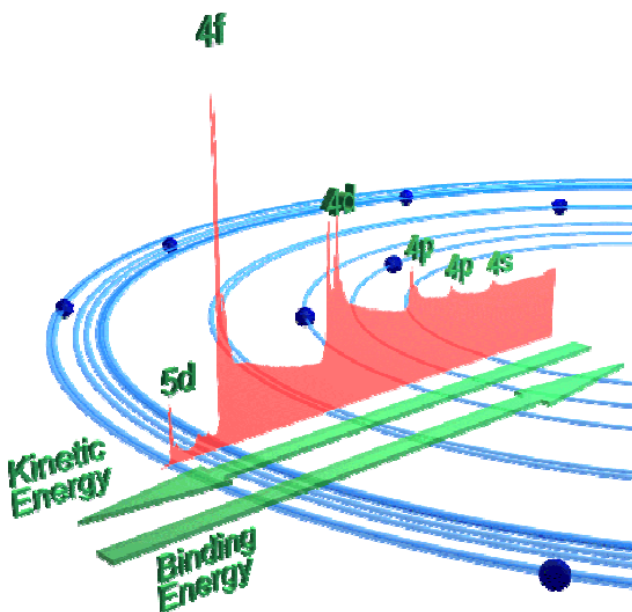
<p>儀器編號 : 1</p> <p>中英文名稱 X 射線光電子能譜儀 X-Ray Photoelectron Spectroscopy, XPS</p> <p>廠牌/型號 Thermo Fisher / K-Alpha</p>	<p>功能</p> <ol style="list-style-type: none"> 1. 定性與定量 (survey) : Atomic% 2. 鍵結判斷 (narrow scan): 以鍵結能的化學位移(chemical shift)判斷 3. 縱深分析 depth profile 4. Mapping 5. Angle Dependent
<p>圖例-1</p> <p>Survey: 可獲得元素組成(定性定量)</p> 	<p>圖例-2</p> <p>Narrow Scan: 藉由化學位移獲得鍵結資訊</p> 
<p>儀器外觀</p>	<p>拒絕樣品: 液態 毒性 揮發性 磁性 Fe Co Ni</p>
	<p>載台: 60mm*60mm 樣品厚度 < 3mm</p> 

The Principles of XPS (1/2)



- X-rays from a photon source impinge on the surface (photon energy = $h\nu$) and eject photoelectrons and the kinetic energy (KE) of these electrons is measured using an analyser
- The binding energy (BE, the energy required to eject an electron) is calculated: $BE = h\nu - KE$
- Binding Energy depends upon
 - The element
 - The orbital from which electron is ejected
 - The chemical state of the element

The Principles of XPS (2/2)



- By scanning the Electron Analyzer a Photoelectron Spectrum is obtained with peaks characteristic of the elements present at the surface
- Peaks corresponding to all the core electrons in each of the surface atoms are clearly visible in the range of the X-ray energy
- Typically only the strongest 'principal' peak of each element present is measured as a narrow high resolution scan

定性:

K-Alpha，以高能電子束，衝擊鋁靶，產生特性 X-Ray 1486.6ev，以此能量去打樣品，物質中的電子獲得能量而可掙脫束縛，進入 XPS 的分析腔，偵檢器測得電子的動能，去反推測束縛能，以鑑定物種所含之元素。

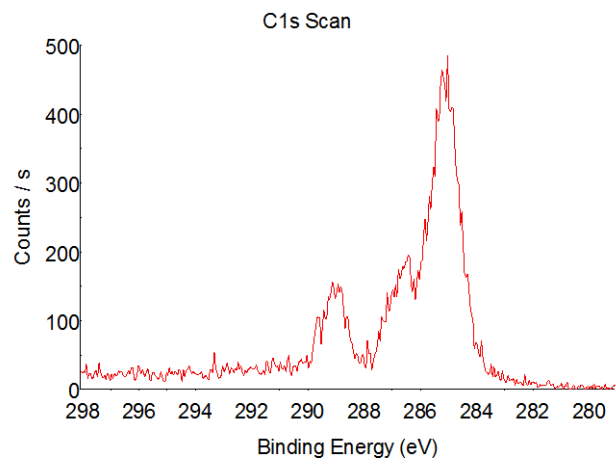
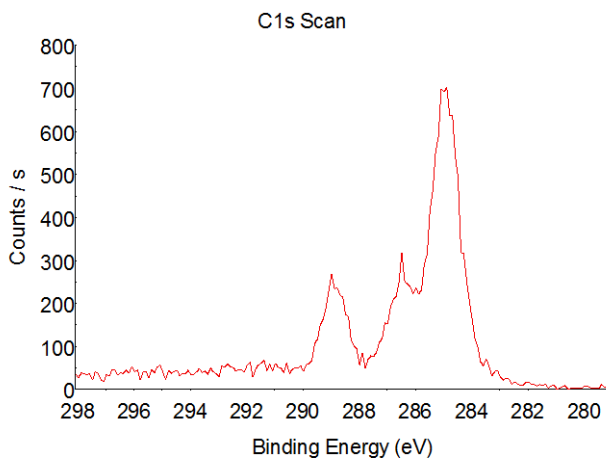
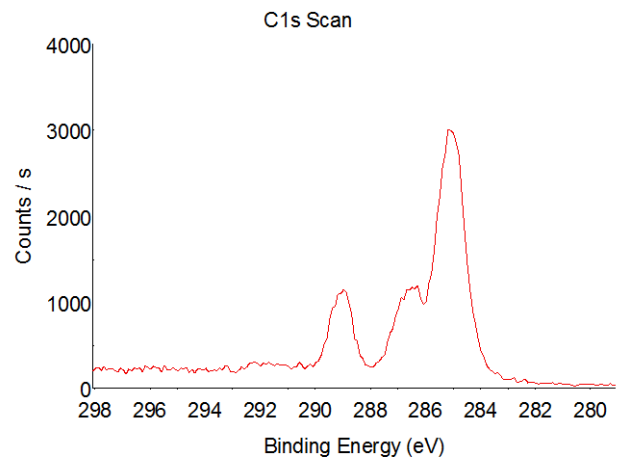
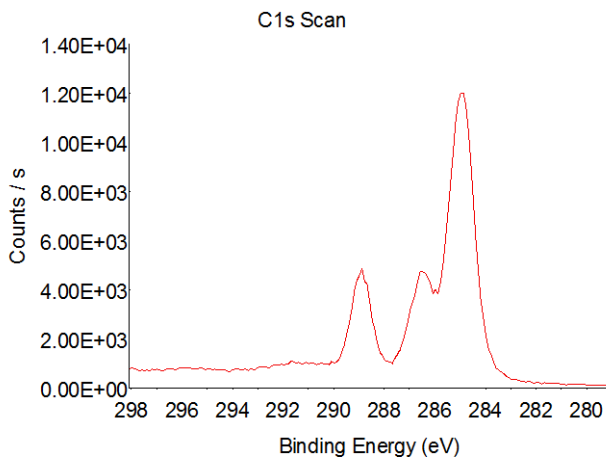
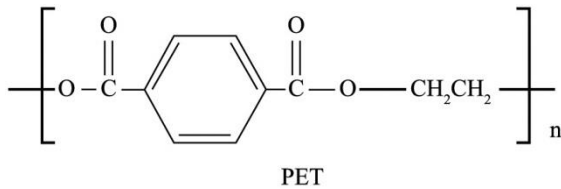
定量:

由圖譜所得之 peak 進行曲線下的面積積分，數據經過 S.F 修正後，可獲得該元素之 Atomic%。

鍵結判斷:

由於互相鍵結元素的陰電性強弱不同，導致碳譜產生化學位移(Cheical Shift)。

下面圖例是相同的 PET 聚對苯二甲酸乙二酯樣品，在不同操作條件下 Narrow Scan 碳譜的結果

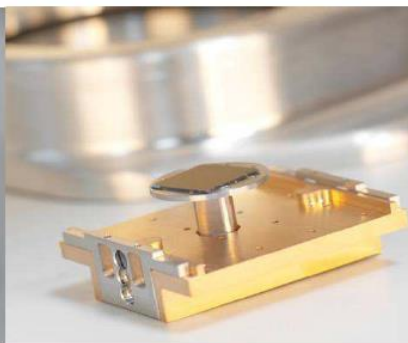


Sample Holders

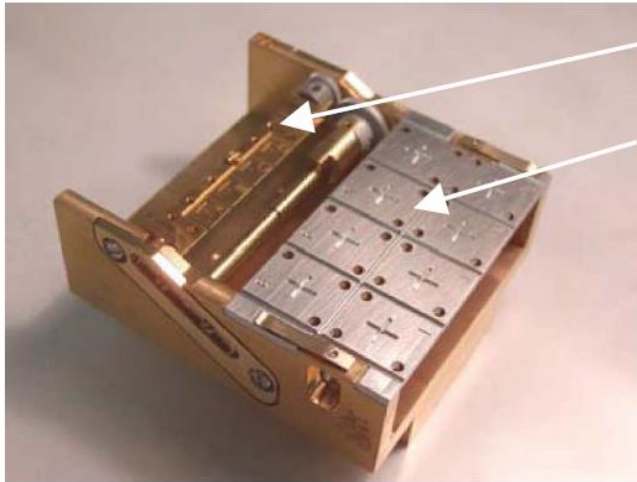
- Large sample holder
 - Analysis area 60 x 60 mm
 - Maximum thickness 20 mm
- Removable sample plate
 - Load samples while previous set is being analysed
- Holder for rotation depth profiles
- Holder for powders



◆ Samples easily secured using a simple clip



Sample Tilt Module for ADXPS



- Sample Tilt Mounting Area here
- Standard Flat Mounting Area here
- Full Range of Sample Tilt Angles available
- Film Thickness measurement
- Relative Depth Plots
- Multiple Sample Positions

