

表一 樣品 A~F 系列實驗條件

<b>Sample A</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A4</b>	<b>A5</b>	<b>A6</b>	<b>A7</b>
Reaction temperature (K)	523	573	623	673	723	773	873
Carbon mole	0.001	0.013	0.023	0.036	0.068	0.047	0.038
<b>Sample B</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B4</b>	<b>B5</b>		
Flow rate (sccm)	1.5	2.8	4.2	5.5	8.3		
Carbon mole	0.007	0.013	0.027	0.028	0.031		
<b>Sample C</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>C5</b>	<b>C6</b>	<b>C7</b>
Reaction time (h)	1	2	3	4.5	6	7.5	9
Carbon mole	0.013	0.016	0.042	0.078	0.179	0.179	0.182
<b>Sample D</b>	<b>D1</b>	<b>D2</b>	<b>D3</b>				
Reaction time (h)	1	3	9				
Carbon mole	0.006	0.058	0.103				
<b>Sample E</b>	<b>E1</b>	<b>E2</b>	<b>E3</b>				
NaOH mmole	1.25	2.5	12.5				
Carbon mole	0.003	0.005	0.023				
<b>Sample F</b>	<b>F1</b>	<b>F2</b>	<b>F3</b>				
NaOH mmole	1.25	2.5	12.5				
Carbon mole	0.016	0.018	0.068				

表二 不同反應溫度所得樣品A系列拉曼光譜圖 $I_D/I_G$ 數值

Temperature (K)	$I_D/I_G$
523	2.1
573	1.65
623	1.6
673	1.53
723	1.43
773	1.38
873	1.31

表三 樣品A系列與已知石墨材料拉曼光譜圖 $I_D/I_G$ 數值比較<sup>34-36</sup>

	<b>Temperature (K)</b>	<b><math>I_D/I_G</math></b>
Samples	523 ~ 873	2.1 ~ 1.31
Commercial graphite	< 2773	0.14
Benzene-derived graphite fiber	1273 ~ 3073	1.2 ~ 0.1

表四 分解氣態乙炔碳氫鍵能量與不同反應條件利用阿瑞尼亞斯方程式 (Arrhenius plot) 求得所需之能量

<b>Bond</b>	<b>Bond Dissociation Energy (kJ mol<sup>-1</sup>)</b>
HC <sub>2</sub> -H	523
<b>Reaction</b>	<b>Energy of activation of the surface-reaction-controlled kinetics (kJ mol<sup>-1</sup>)</b>
AAO assisted at 773 - 973 K	80
NaH reacted with C <sub>2</sub> H <sub>2</sub> at 523 - 623 K	65
NaOH reacted with C <sub>2</sub> H <sub>2</sub> at 523 - 723K	64