Supporting Information

[1]Chemical modification of vertically aligned graphene standing on SiC microspheres for selective oxidation

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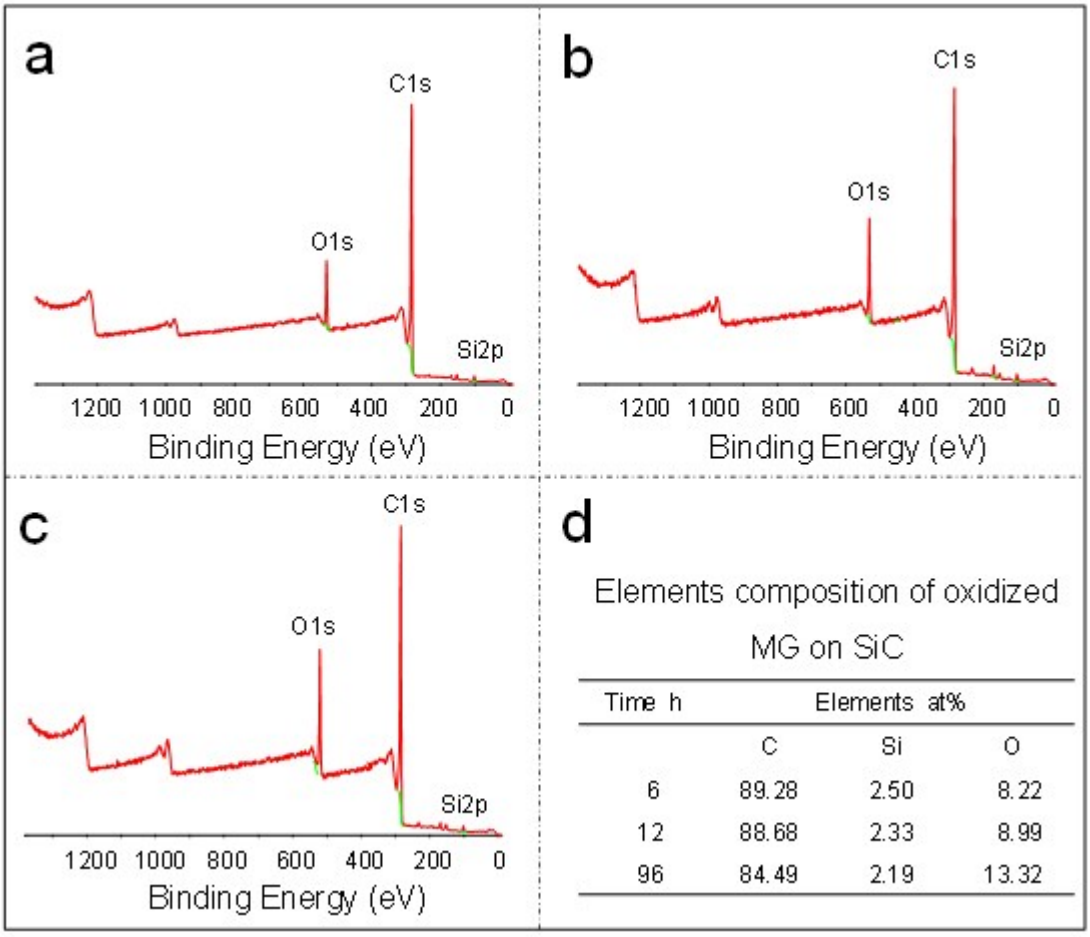
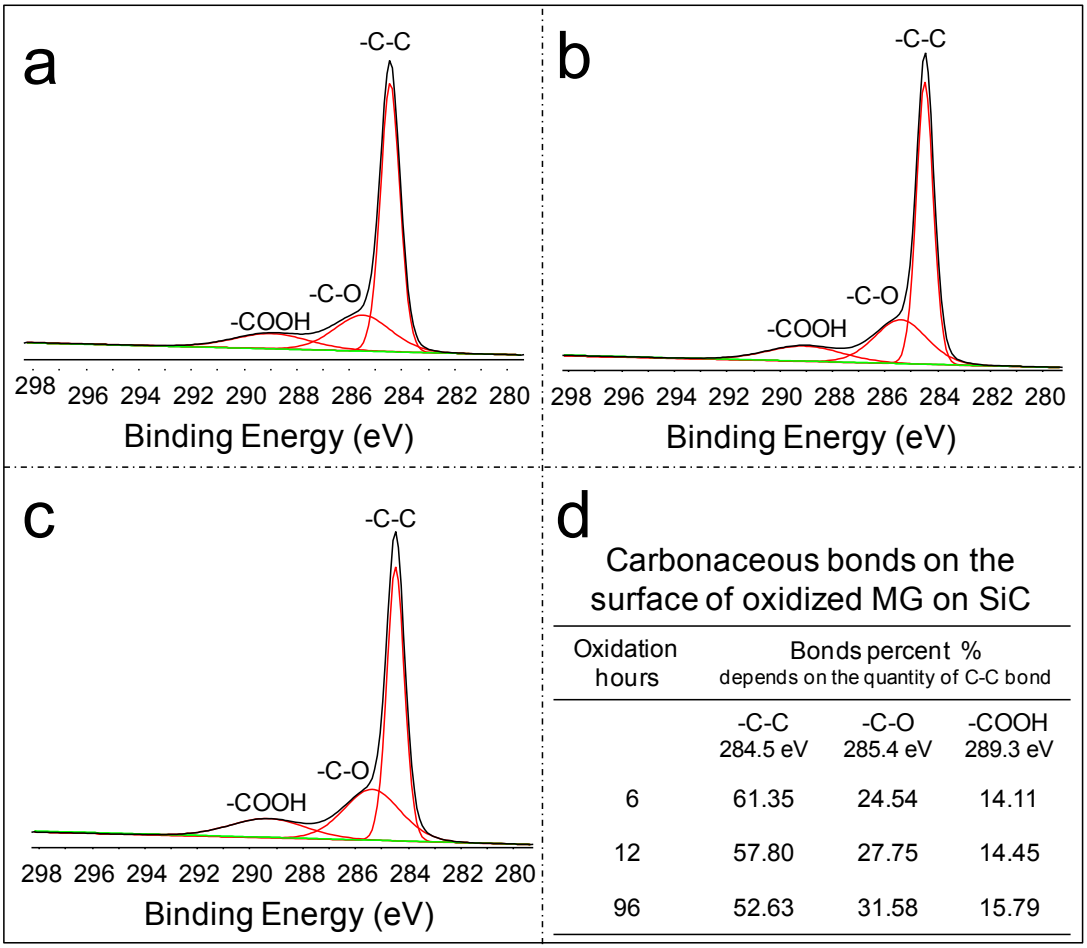
1. The XPS surveys of the oxidized MG on SiC



Time h	Elements at%		
	C	Si	O
6	89.28	2.50	8.22
12	88.68	2.33	8.99
96	84.49	2.19	13.32

Figure 1s The XPS spectra of the MG on SiC oxidized in concentrated HNO_3 for 6 (a), 12 (b), 96 (c) hours, respectively; the elements composition on the surface (d) of oxidized MG on SiC

2. C1s high resolution XPS analysis of the oxidized MG on SiC



d

Carbonaceous bonds on the surface of oxidized MG on SiC

Oxidation hours	Bonds percent % depends on the quantity of C-C bond		
	-C-C 284.5 eV	-C-O 285.4 eV	-COOH 289.3 eV
6	61.35	24.54	14.11
12	57.80	27.75	14.45
96	52.63	31.58	15.79

Figure 2s The high resolution C1s XPS analysis of the oxidized MG on SiC after treated in concentrated HNO_3 for 6 (a), 12 (b), 96 (c) hours, respectively; (d) the calculated carbonaceous bonds on the surface of the MG on SiC

3. N1s high resolution XPS analysis of the NG on SiCm samples

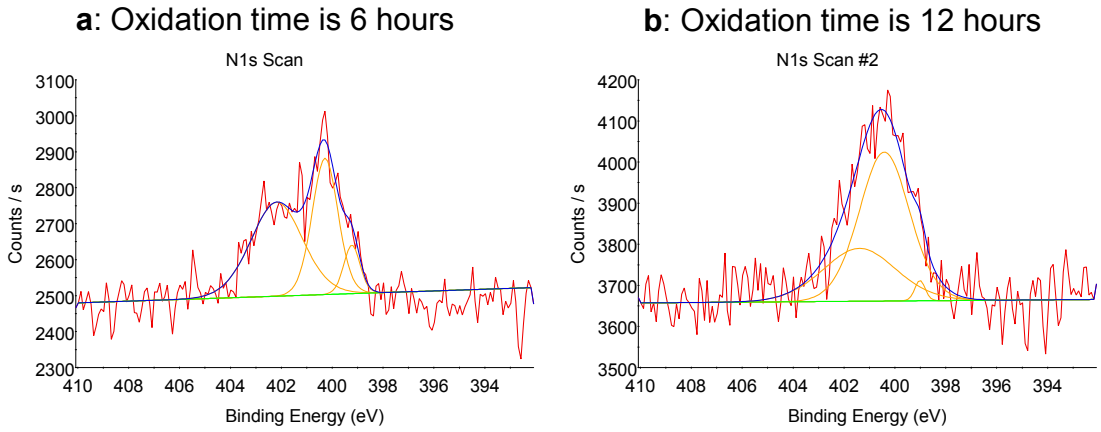


Figure 3s The N1s high resolution XPS analysis of the NG on SiCm prepared by the reactions between hydrazine and the MG on SiC oxidized in concentrated HNO_3 for 6 (a) and 12 (b) hours, respectively.

4. Raman spectra of NG on SiCm samples

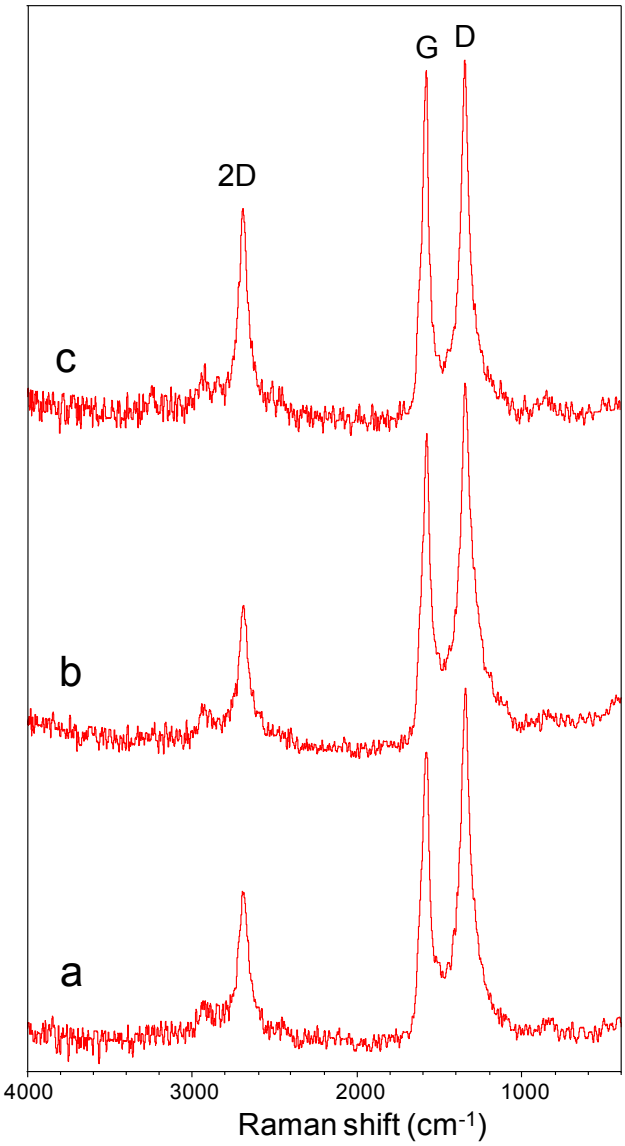


Figure 4s The Raman spectra of NG on SiCm which prepared by the reduction reactions with hydrazine and oxidized MG on SiC that treated in concentrated HNO_3 for 6 (a), 12 (b) and 96 (c) hours.

5. The XRD pattern of the NG on SiCm

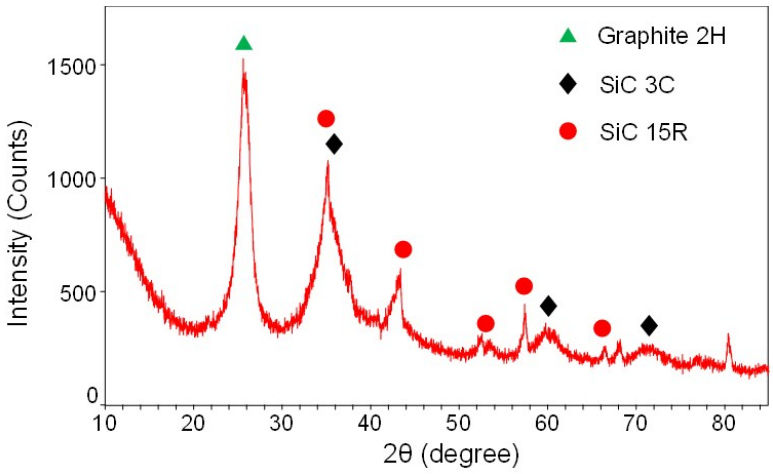


Figure 5s The XRD pattern of the NG on SiCm prepared by the reactions between hydrazine and the MG on SiC oxidized in concentrated HNO_3 for 96 hours

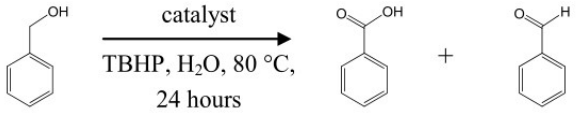
6. The I_D/I_G and I_{2D}/I_G value of the NG on SiCm samples based on the Raman analysis

Table 1s The I_D/I_G and I_{2D}/I_G values of the NG on SiCm samples (prepared by the reactions between hydrazine and the MG on SiC oxidized in HNO_3 for 6, 12 and 96 hours)

Oxidation Time	I_D/I_G	I_{2D}/I_G
96 hours	1.028	0.615
12 hours	1.151	0.469
6 hours	1.206	0.548

7. The selectivity oxidation of benzyl alcohol with NG on SiCm as catalyst

Table 2s The selectivity oxidation of benzyl alcohol with NG on SiCm as catalyst



Catalyst	N [at%]	Conversion Rate [%]	Yeild [%]	
None	0	7.4	2.0	5.4
MG on SiC	0	36.3	14.8	21.5
NG on SiCm	1.88	50.4	33.3	17.1
NG on SiCm	2.01	72.4	60.0	12.4
NG on SiCm	2.14	99.9	99.1	0.08

Footnote: Typical reaction conditions: benzyl alcohol (5 m mol), TBHP (30 m mol), catalyst (20 mg), 24 hours, 80 °C. The conversion rate and selectivity were examined by GCMS while *n*-dodecane was applied as internal standard.