SUPPORTING INFORMATION

General Information

The GC/MS spectra were recorded on a Shimadzu QP5050A spectrometer interfaced with a Schimadzu GC17A gas chromatograph.

^{13}C and ^{1}H NMR spectra were obtained using a Varian 400 MHz spectrometer. Deuterated chloroform ($CDCl_3$) was used as the solvent for obtaining NMR spectra.

Thin Layer Chromatography was first performed using aluminum backed silica gel 60 F_{254} plates. TLC visualizations were done by ultraviolet light. After retention factors (R_f) were determined, the product mixture is separated using silica gel 60 F_{254} TLC precoated glass plates.

The carbon arc reactor was modeled as described by Skell and coworkers [1]. Carbon vapor is produced in an arc between two graphite electrodes and cocondensed on a liquid nitrogen cooled surface with an excess of substrate. Thus, reactions of carbon atoms occur in the condensed phase at temperatures somewhere between that at which they are produced, ~2500^{0}C, and –196^{0}C. Carbon atoms are produced at low pressures (~5×10^{-5} torr).

Most of the chemicals were used as received from the Aldrich Chemical Co.

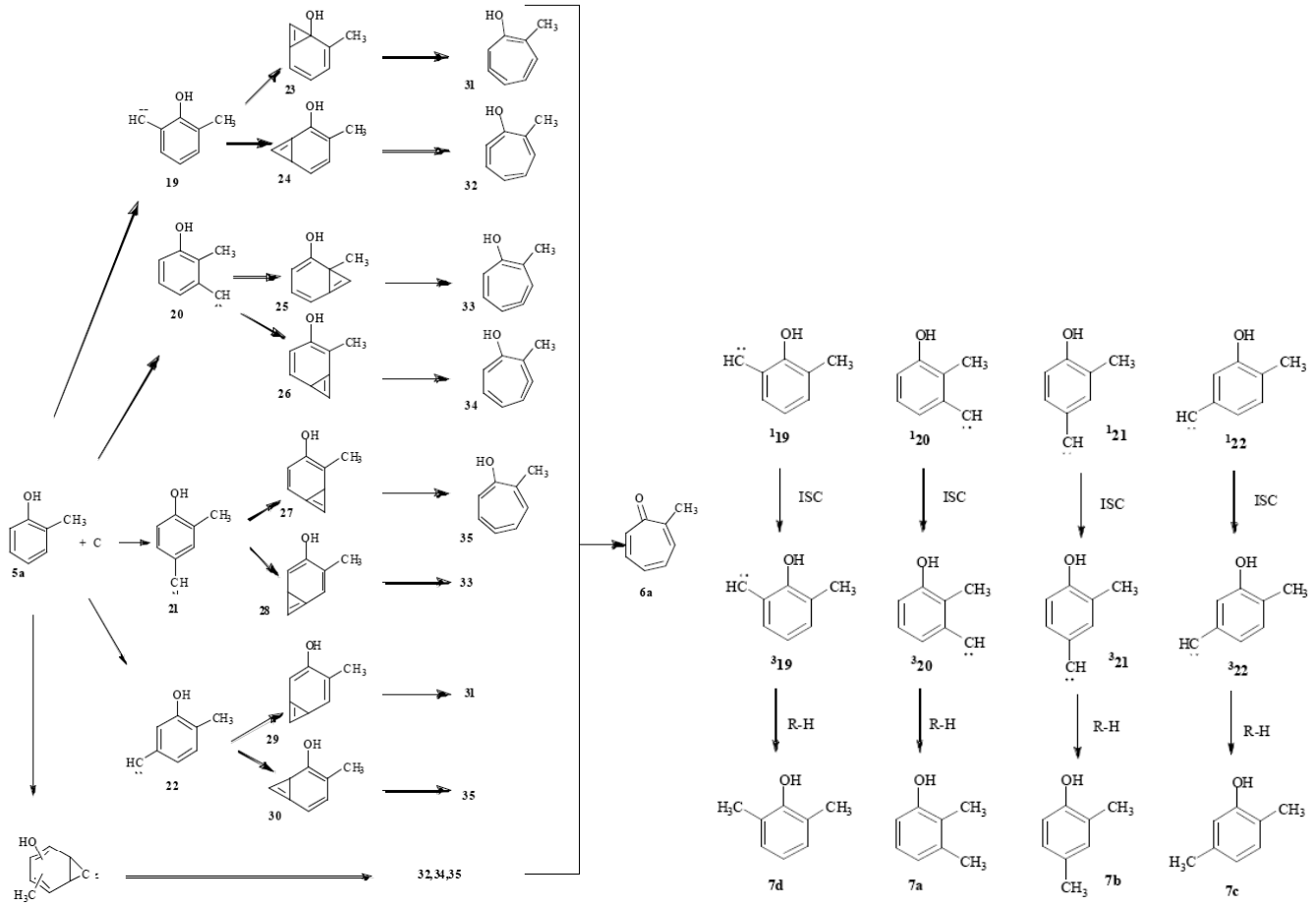


Fig. (1). Proposed Mechanisms of Product Formation in the Reaction of C + **5a**.

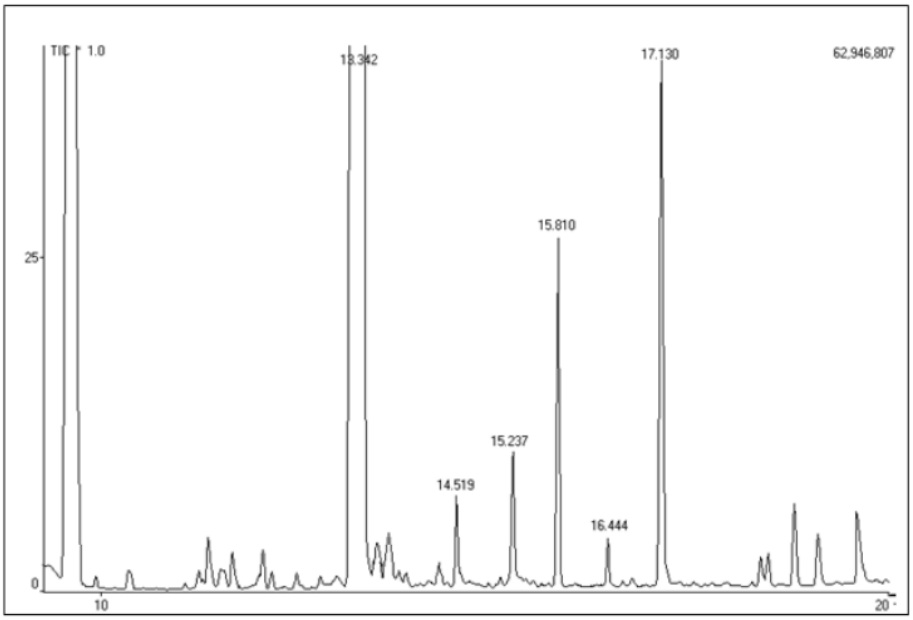


Fig. (2). GC/MS spectrum of the product from C atom reaction of **5a**.

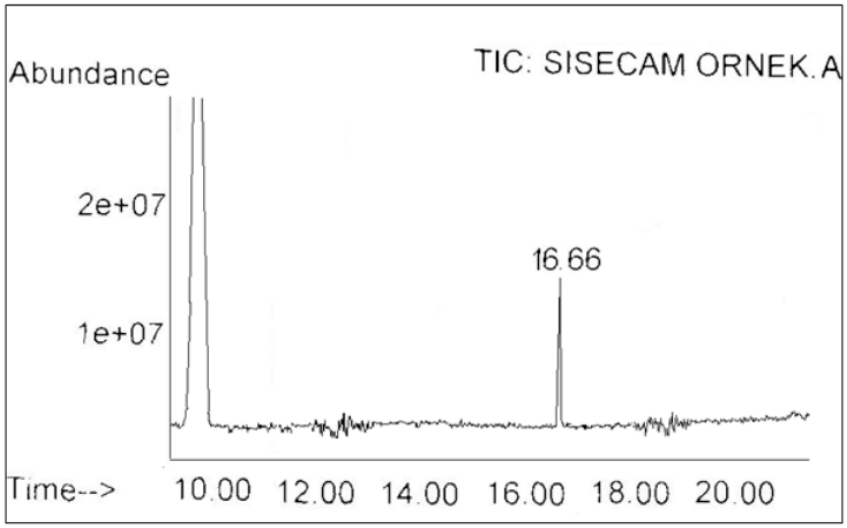


Fig. (3). GCMS spectrum of the product received by TLC from C atom reaction of **5a**.

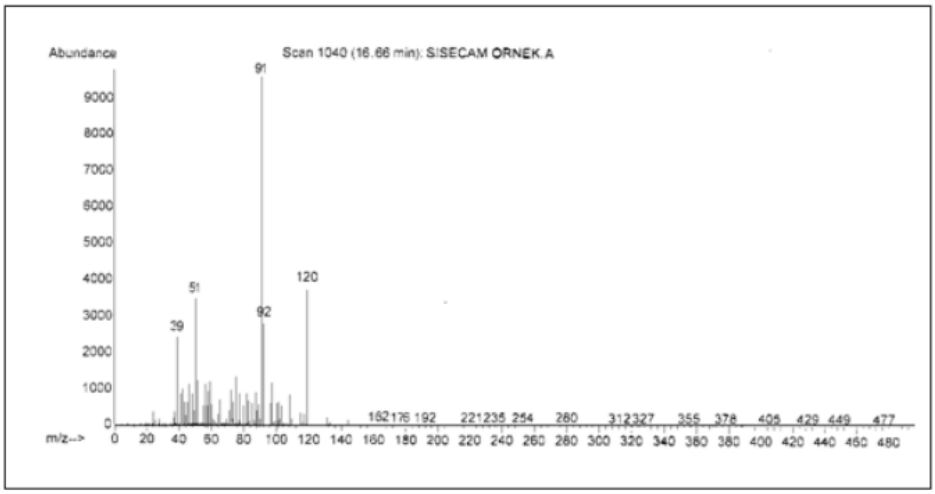
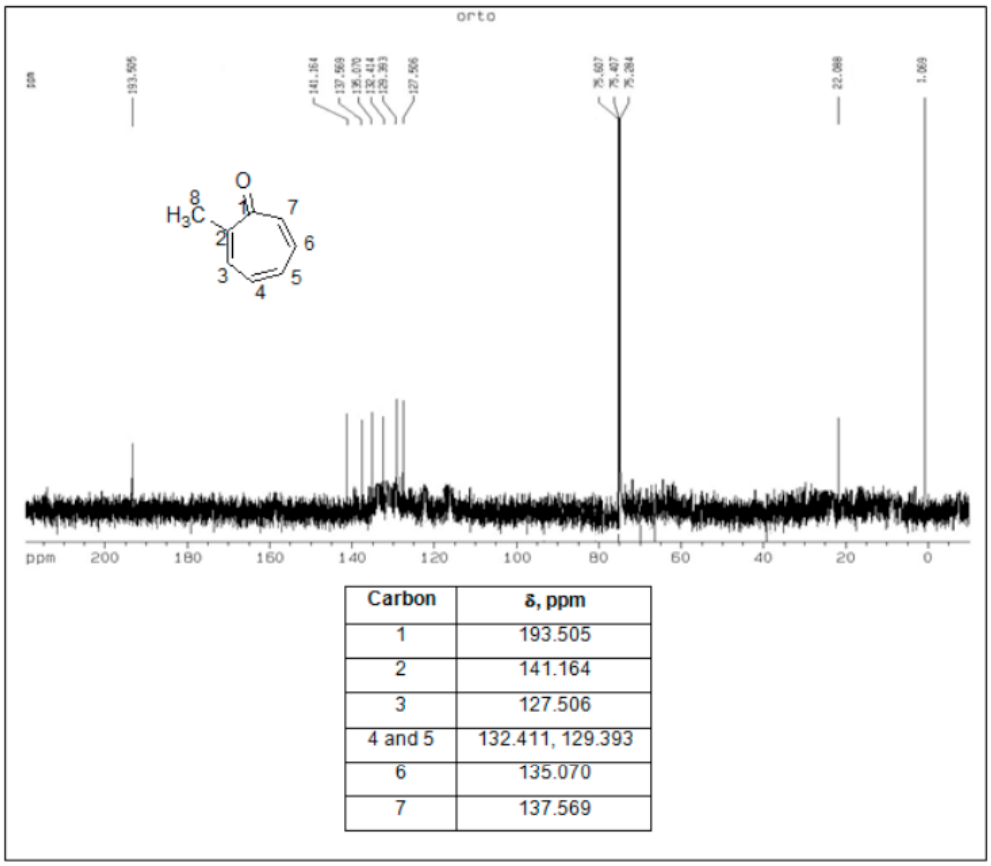
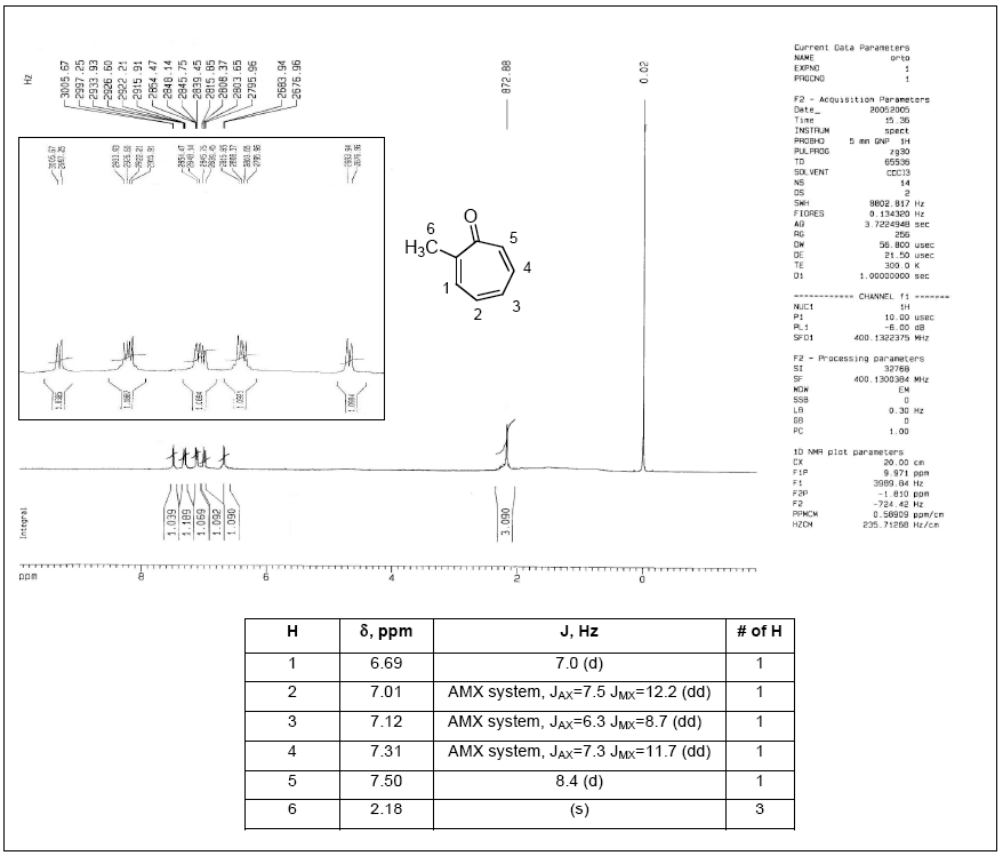


Fig. (4). MS fragmentation spectrum of the peak at 16.66 minute.



Carbon	δ, ppm
1	193.505
2	141.164
3	127.506
4 and 5	132.411, 129.393
6	135.070
7	137.569

Fig. (5).[13]C NMR spectrum of product received by TLC from C atom reaction of **5a**.



H	δ, ppm	J, Hz	# of H
1	6.69	7.0 (d)	1
2	7.01	AMX system, J_{AX}=7.5 J_{MX}=12.2 (dd)	1
3	7.12	AMX system, J_{AX}=6.3 J_{MX}=8.7 (dd)	1
4	7.31	AMX system, J_{AX}=7.3 J_{MX}=11.7 (dd)	1
5	7.50	8.4 (d)	1
6	2.18	(s)	3

Fig. (6).[1]H NMR spectrum of the product received by TLC from C atom reaction of **5a**.

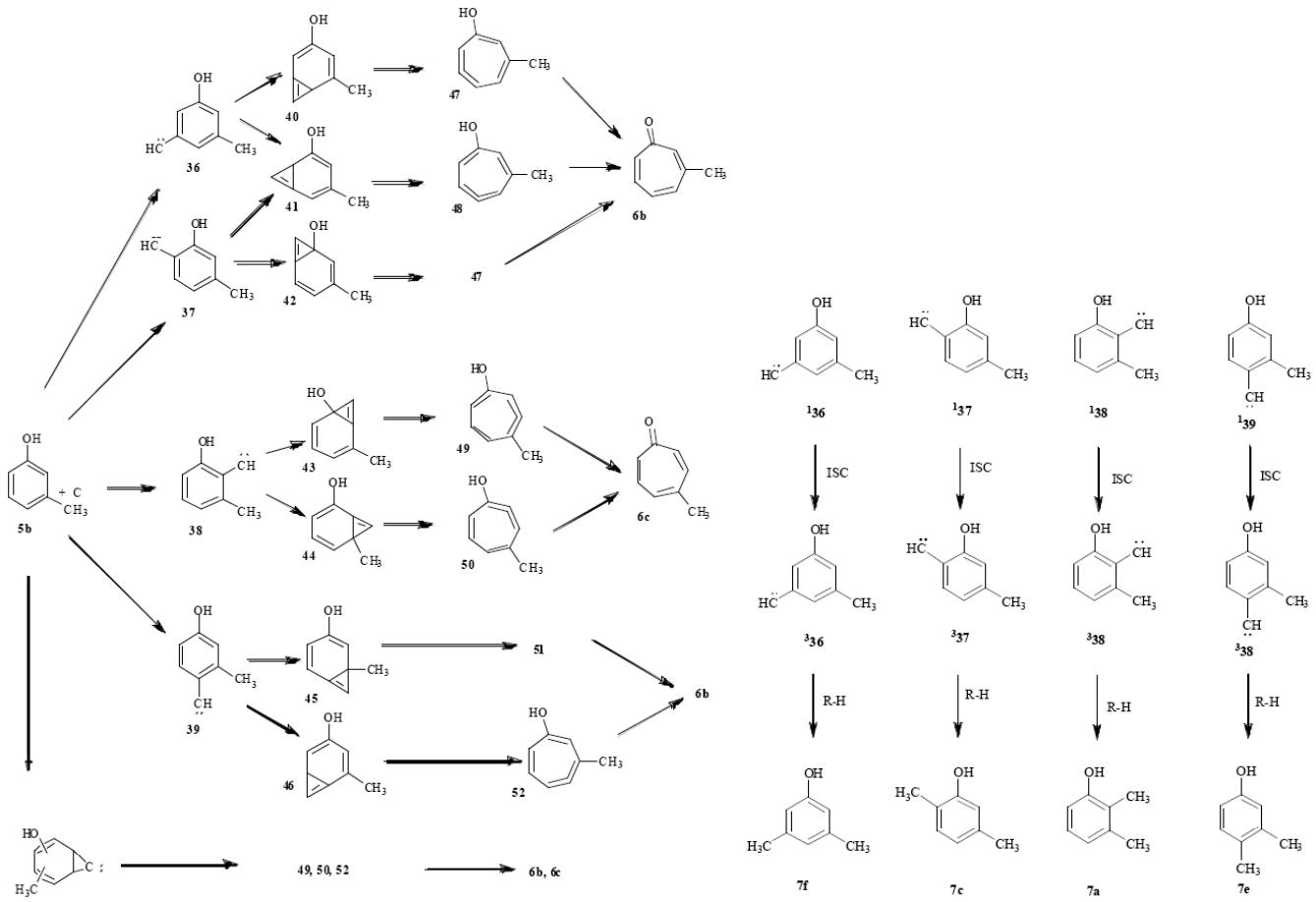


Fig. (7). Proposed Mechanisms of Product Formation in the Reaction of C + **5b**.

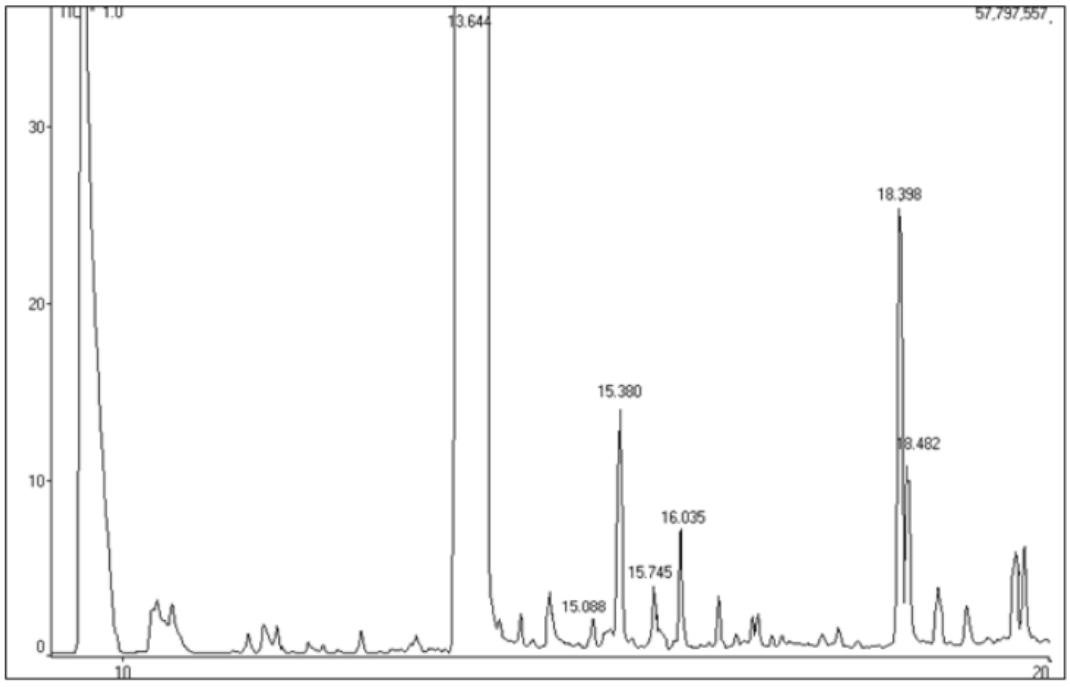


Fig. (8). GC/MS spectrum of the product from the C atom reaction of **5b**.

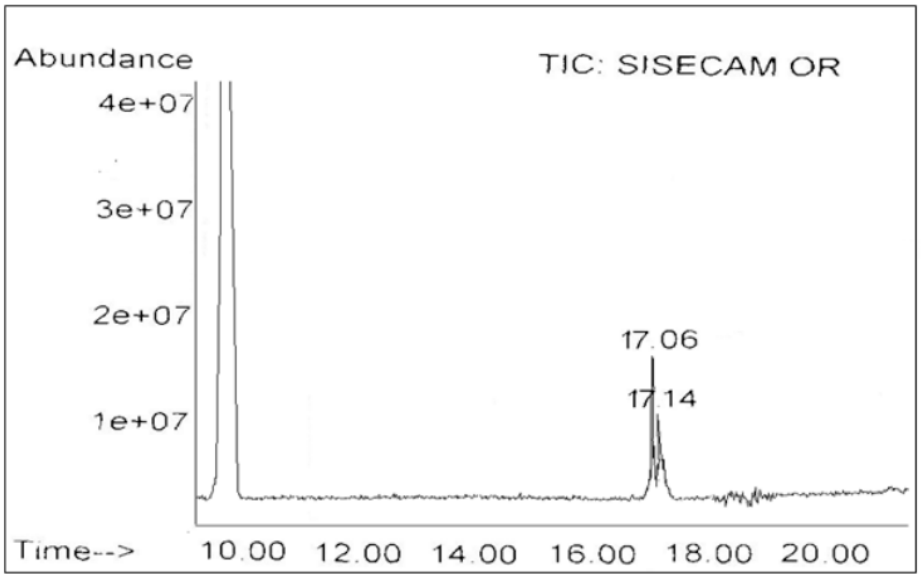


Fig. (9). GCMS spectrum of the product received by TLC from C atom reaction of **5b**.

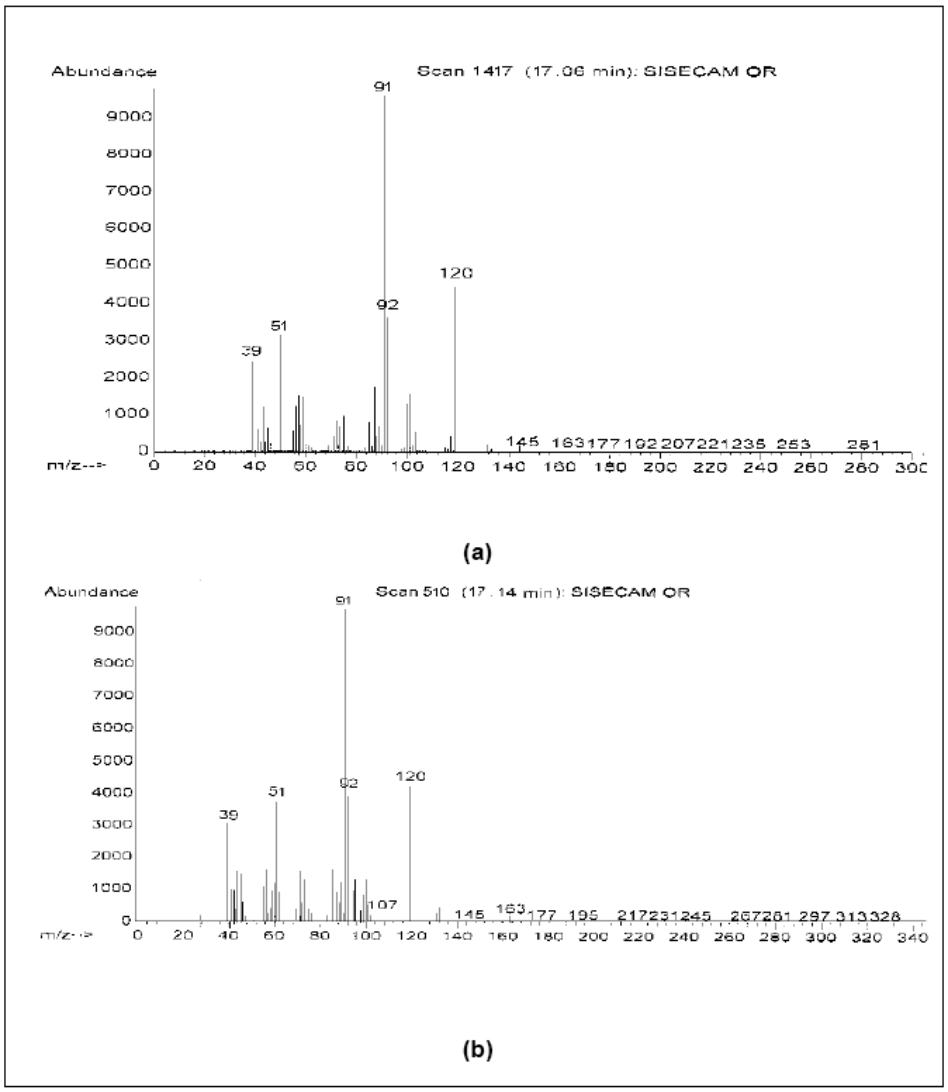
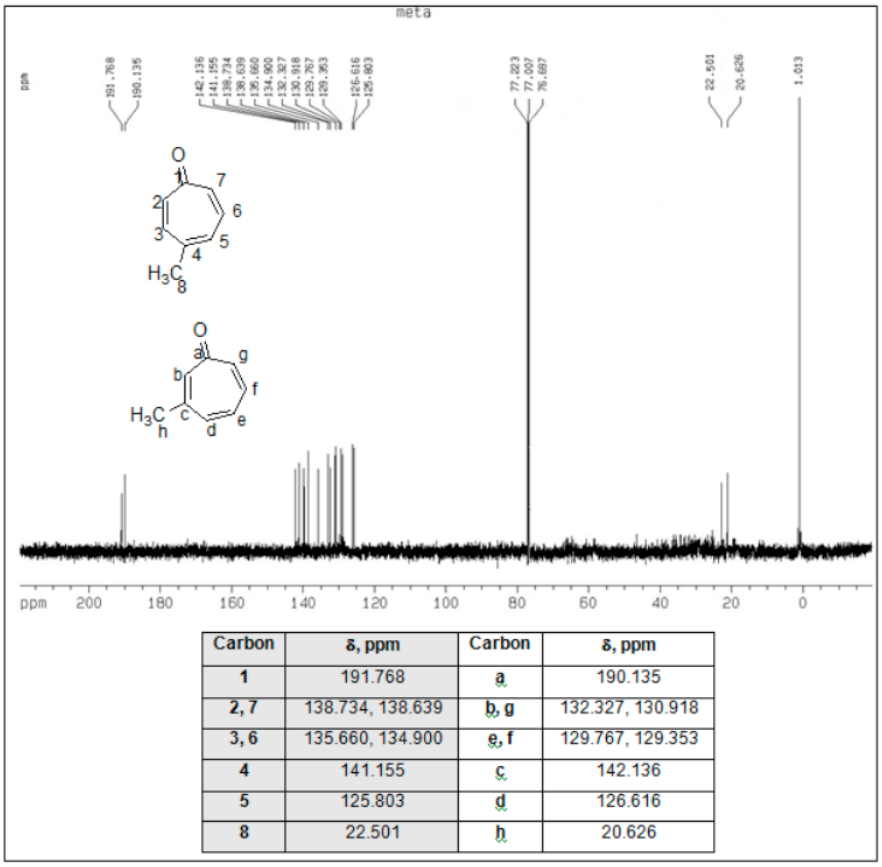
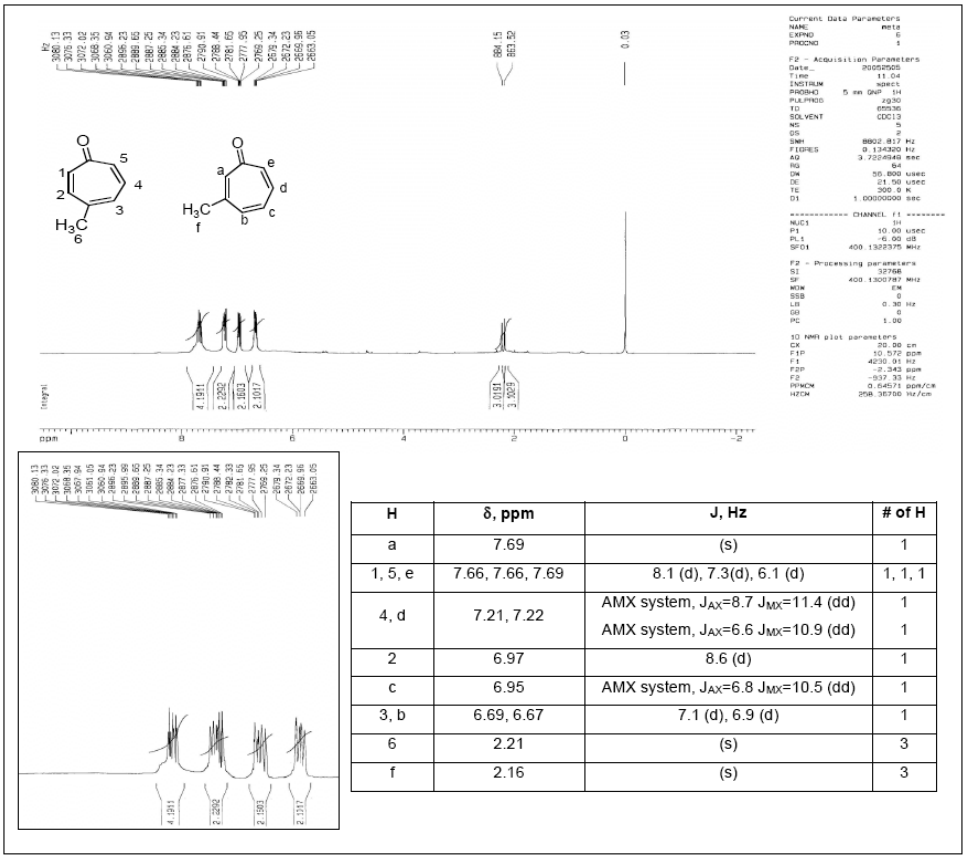


Fig. (10). MS fragmentation spectra of the peaks at (**a**) 17.06 minute (**b**) 17.14 minutes.



Carbon	δ, ppm	Carbon	δ, ppm
1	191.768	a	190.135
2, 7	138.734, 138.639	b, g	132.327, 130.918
3, 6	135.660, 134.900	e, f	129.767, 129.353
4	141.155	c	142.136
5	125.803	d	126.616
8	22.501	h	20.626

Fig. (11). ^{13}C NMR spectrum of the product received by TLC from Catom reaction of **5b**.



H	δ, ppm	J, Hz	# of H
a	7.69	(s)	1
1, 5, e	7.66, 7.66, 7.69	8.1 (d), 7.3(d), 6.1 (d)	1, 1, 1
4, d	7.21, 7.22	AMX system, J_{AX}=8.7 J_{MX}=11.4 (dd) AMX system, J_{AX}=6.6 J_{MX}=10.9 (dd)	1 1
2	6.97	8.6 (d)	1
c	6.95	AMX system, J_{AX}=6.8 J_{MX}=10.5 (dd)	1
3, b	6.69, 6.67	7.1 (d), 6.9 (d)	1
6	2.21	(s)	3
f	2.16	(s)	3

Fig. (12). ^{1}H NMR spectrum of product received by TLC from Catom reaction of **5b**.

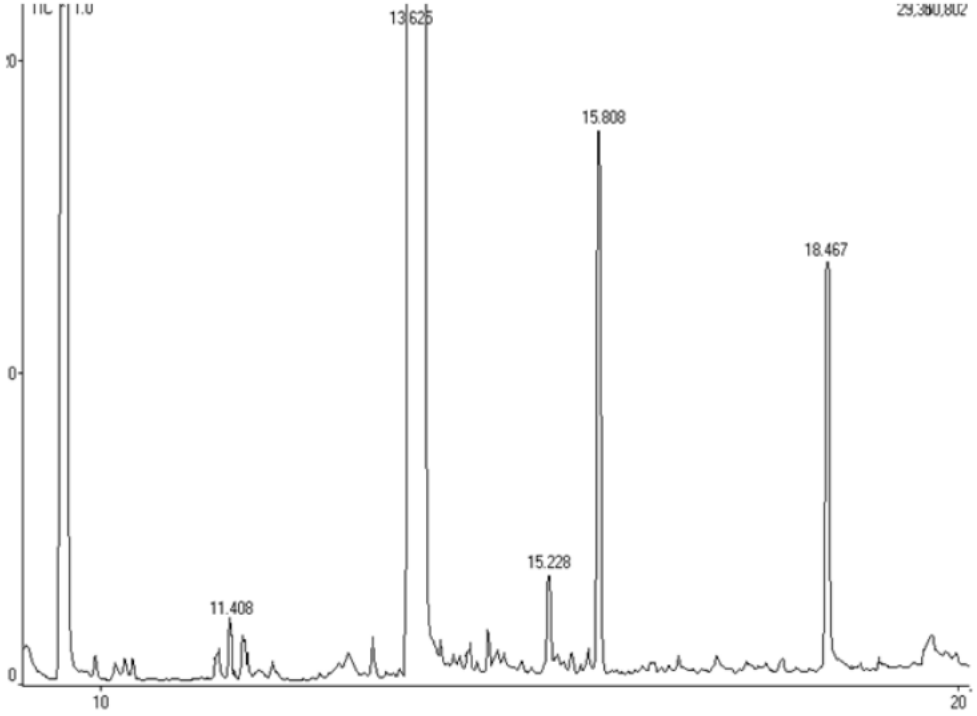


Fig. (13). GC/MS spectrum of the product from the C atom reaction of **5c**.

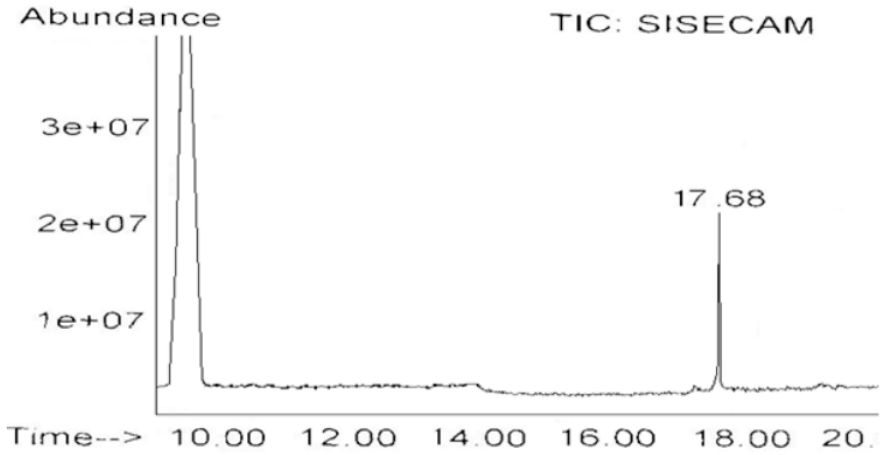


Fig. (14). GCMS spectrum of the product received by TLC from C atom reaction of **5c**.

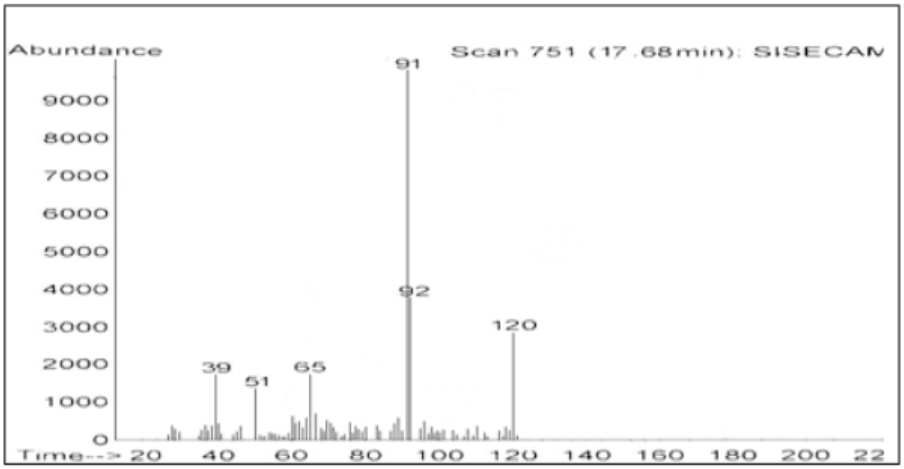
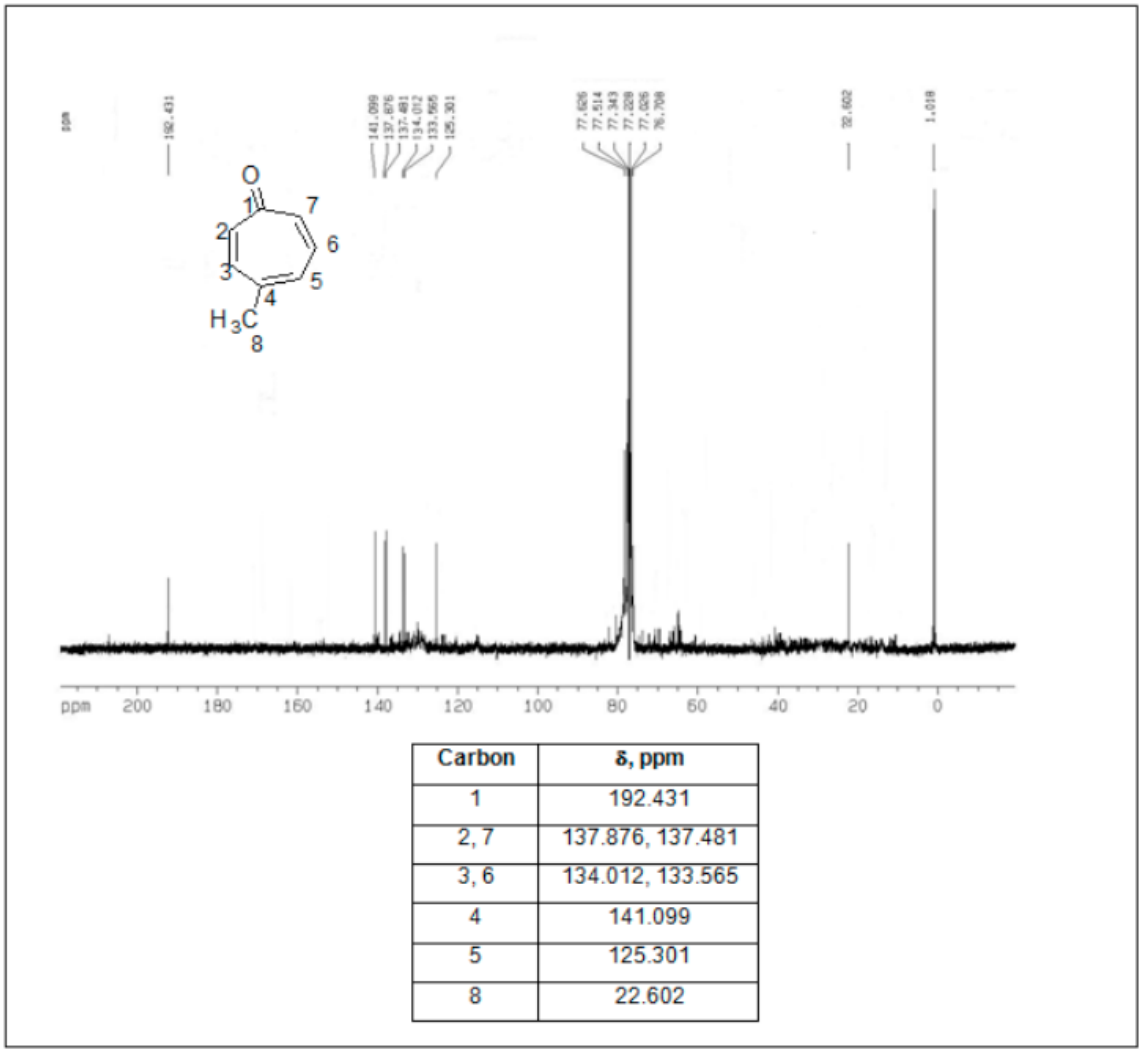
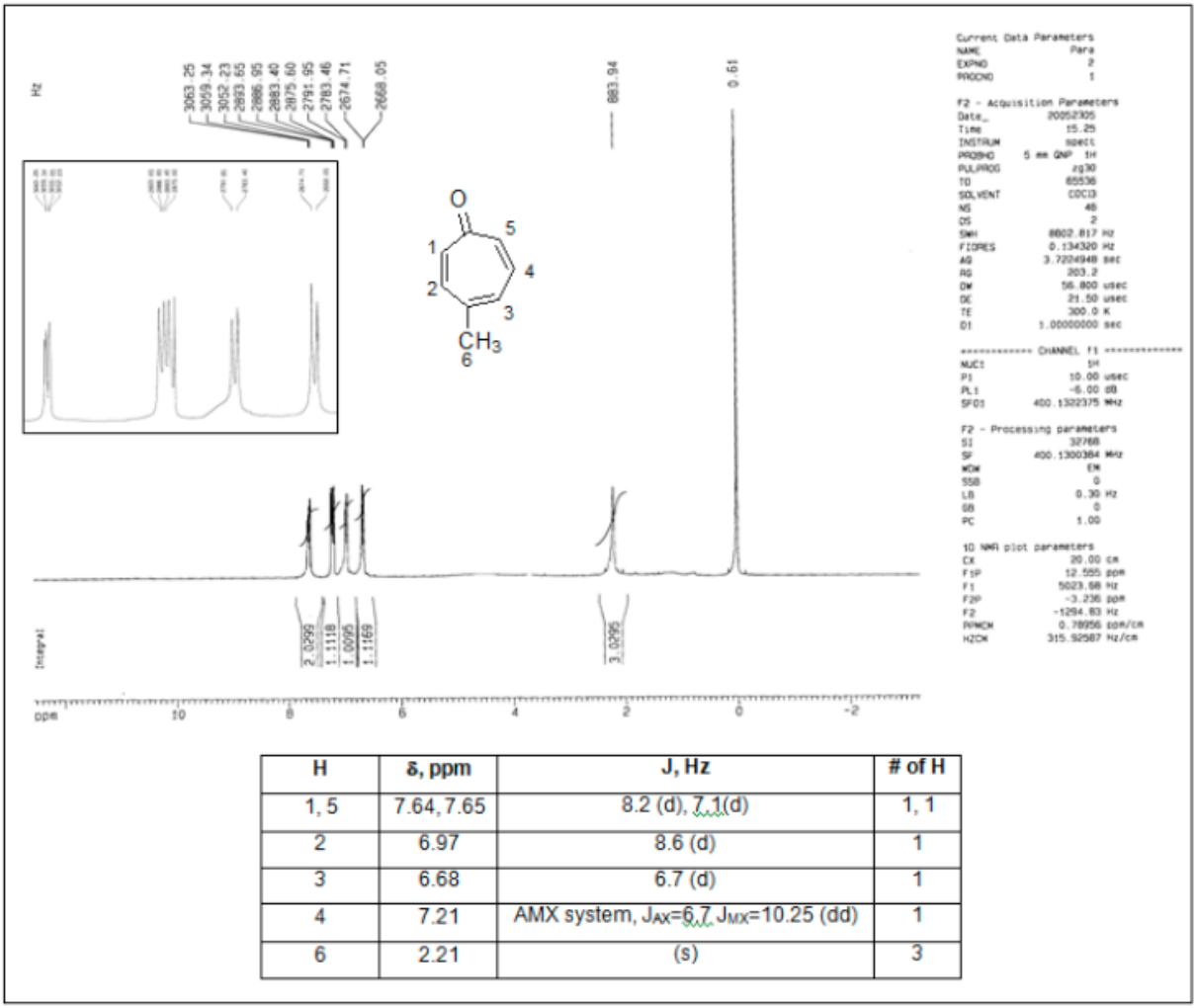


Fig. (15). MS fragmentation spectrum of the peak at 17.68 minute.



Carbon	δ, ppm
1	192.431
2, 7	137.876, 137.481
3, 6	134.012, 133.565
4	141.099
5	125.301
8	22.602

Fig. (16). ^{13}C NMR spectrum of the product received by TLC from C atom reaction of **5c**.



H	δ, ppm	J, Hz	# of H
1, 5	7.64, 7.65	8.2 (d), 7.1(d)	1, 1
2	6.97	8.6 (d)	1
3	6.68	6.7 (d)	1
4	7.21	AMX system, J_{AX}=6.7 J_{MX}=10.25 (dd)	1
6	2.21	(s)	3

Fig. (17). ^{1}H NMR spectrum of the product received by TLC from C atom reaction of **5c**.