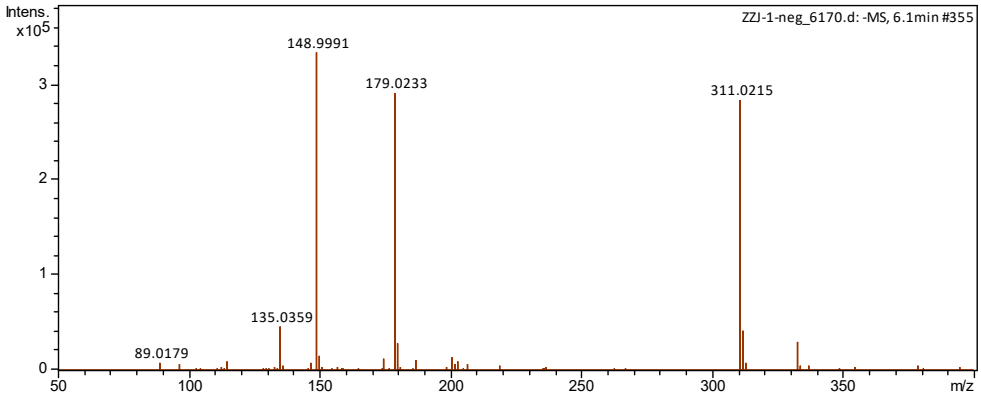
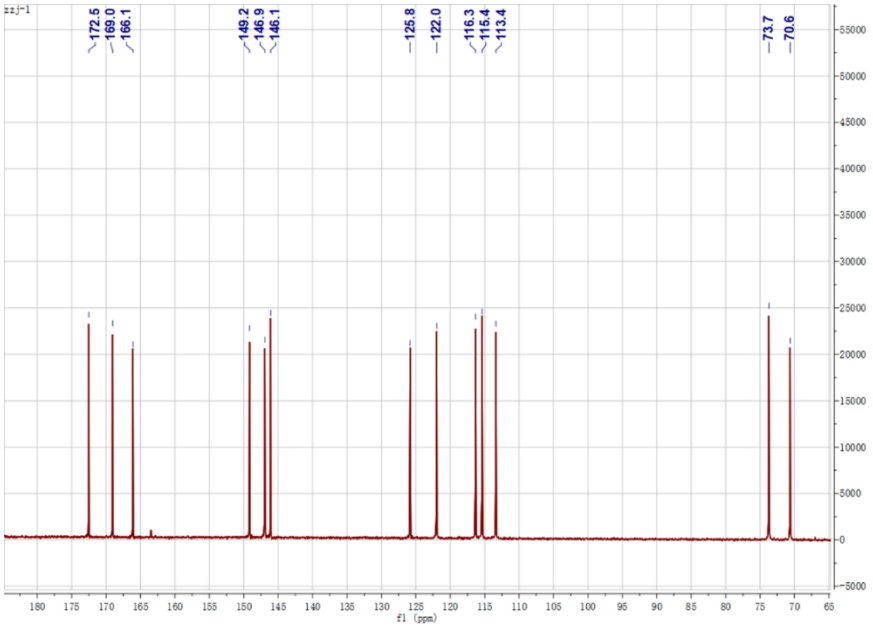
Compound I

Negative ESI-MS, m/z 311.0215 $[M–H]^-$. ^{1}H-NMR (DMSO-d_6, 400 MHz) δ (ppm): 7.59 (1H, d, J = 16.0 Hz, H-7′), 7.07 (1H, s, H-2′), 7.03 (1H, d, J = 8.0 Hz, H-6′), 6.80 (1H, d, J = 8.0 Hz, H-5′), 6.26 (1H, d, J = 16.0 Hz, H-8′), 5.35 (1H, d, J = 4.0 Hz, H-2), 4.61 (1H, s, H-3); ^{13}C-NMR (DMSO-d_6, 100 MHz) δ (ppm): 172.5 (C-4), 169.1 (C-1), 166.1 (C-9′), 149.2 (C-4′), 146.9 (C-7′), 146.1 (C-3′), 125.8 (C-1′), 122.0 (C-6′), 116.3 (C-5′), 115.4 (C-2′), 113.4 (C-8′), 73.7 (C-2), 70.63 (C-3). By comparison with reported data,[20] compound I was identified caffeoyl tartaric acid.

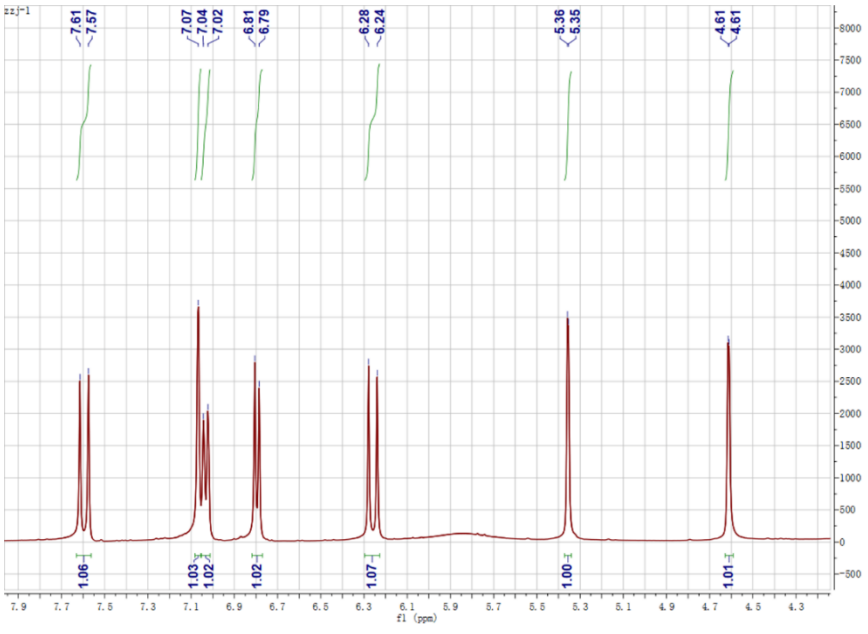
HPLC-MS



^{13}C-NMR



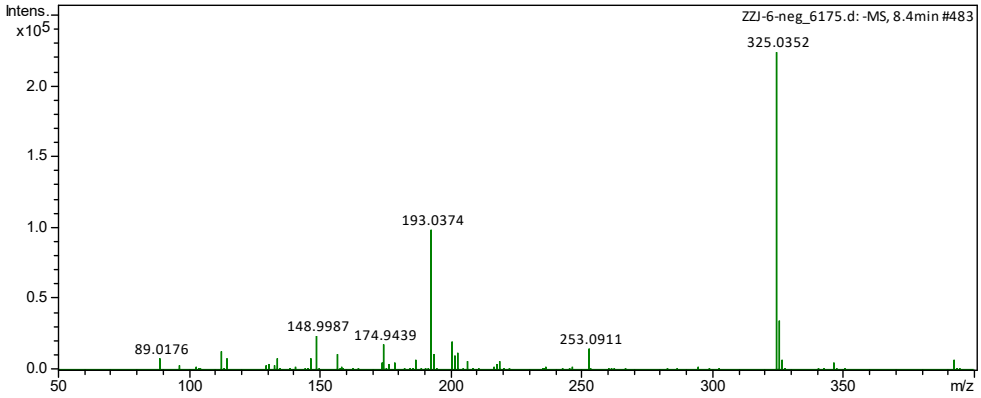
^{1}H-NMR



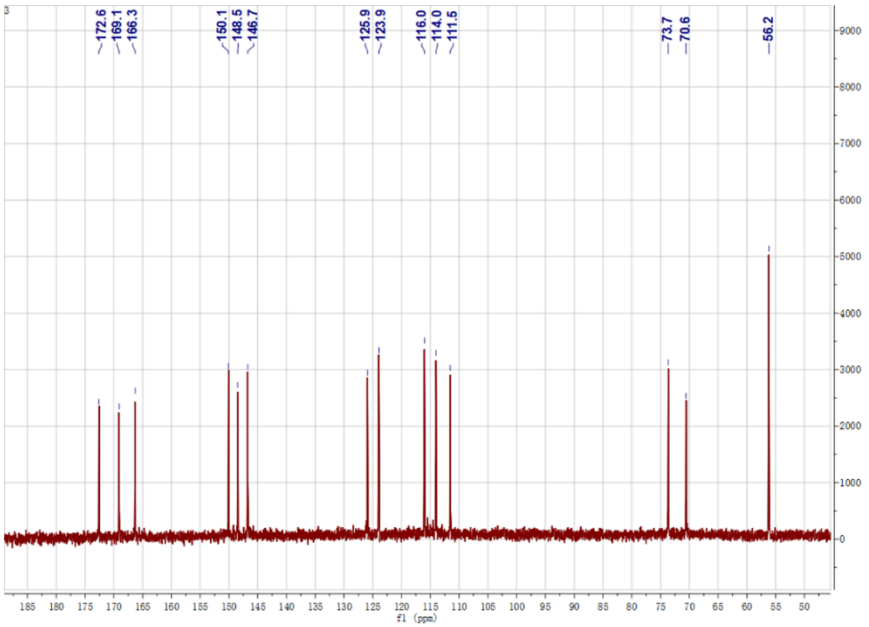
Compound II

Negative ESI-MS, m/z 325.0352 $[M–H]^{–}$. ^{1}H-NMR (DMSO-d_6, 400 MHz) δ (ppm): 7.64 (1H, d, J = 16.0 Hz, H-8′), 7.34(1H, s, H-2′),7.12 (1H, d, J = 8.0 Hz, H-6′), 6.81 (1H, d, J = 8.0 Hz, H-5′), 6.49 (1H, d, J = 16.0 Hz, H-7′), 5.36 (1H, s, H-2), 4.59 (1H, s, H-3), 3.83 (3H, s, -OCH_3); ^{13}C-NMR (DMSO-d_6, 100 MHz) δ (ppm): 172.6 (C-1), 169.1 (C-4), 166.3 (C-9′), 150.1 (C-4′), 148.5 (C-3′), 146.7 (C-7′), 125.9 (C-1′), 123.9 (C-6′), 116.0 (C-2′),114.0 (C-5′), 111.5 (C-8′), 73.7 (C-2), 70.6 (C-3), 56.2 (-OCH_3). By comparison with reported data,[21] compound II was identified as feruloyl tartaric acid.

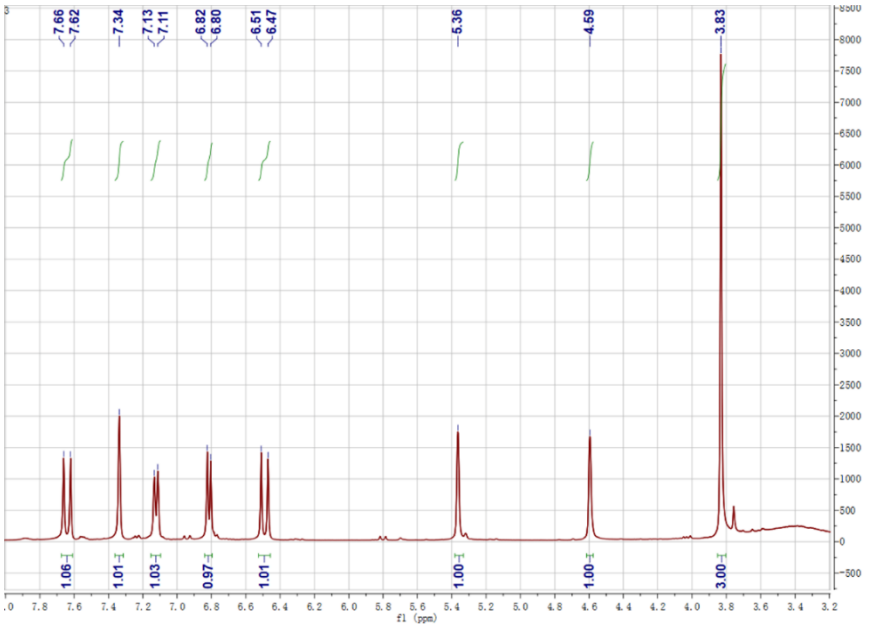
HPLC-MS



^{13}C-NMR



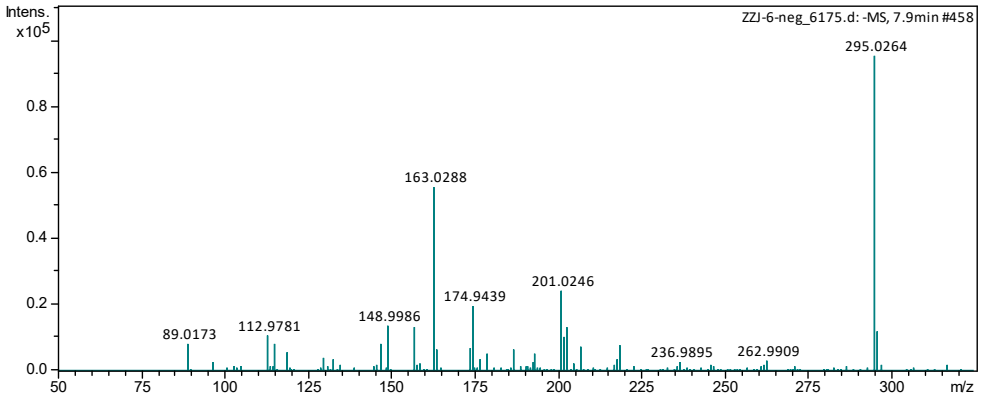
^{1}H-NMR



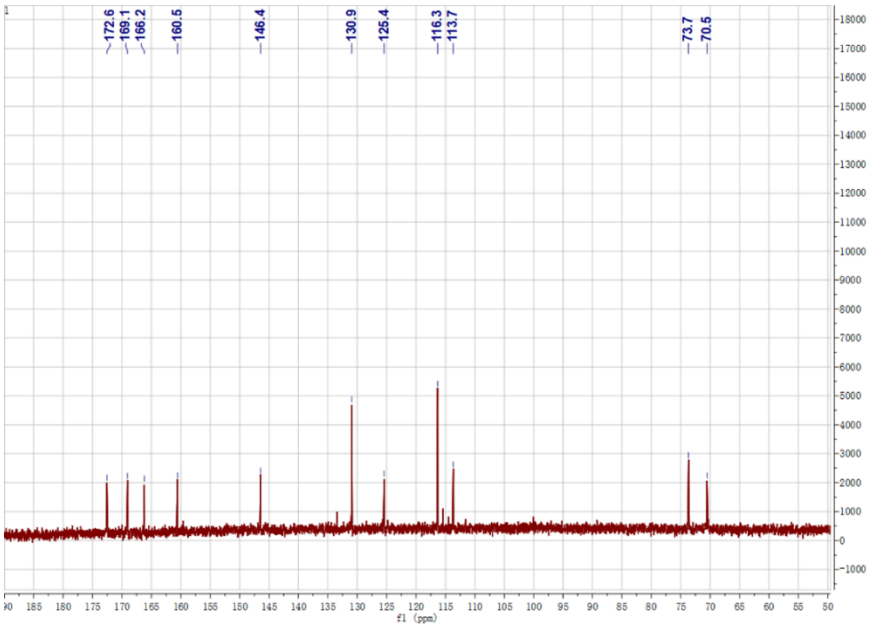
Compound III

Negative ESI-MS, m/z 295.0264 $[M–H]^-$. ^{1}H-NMR (DMSO-d_6, 400 MHz) δ (ppm): 7.65 (1H, d, J = 16.0 Hz, H-7′), 7.57 (2H, d, J = 8.0 Hz, H-2′, 6′), 6.81 (2H, d, J = 8.0 Hz, H-3′, 5′), 6.39 (1H, d, J = 16.0 Hz, H-8′), 5.34 (1H, d, J = 4.0 Hz, H-2), 4.88 (1H, d, J = 4.0 Hz, H-3); ^{13}C-NMR (DMSO-d_6, 100 MHz) δ (ppm): 172.6 (C-4), 169.1 (C-1), 166.2 (C-9′), 160.6 (C-4′), 146.4 (C-7′), 130.9 (C-2′, 6′), 125.4 (C-1′), 116.3 (C-3′, 5′), 113.7 (C-8′), 73.7 (C-2), 70.5 (C-3). By comparison with reported data,[22] compound III was identified as coumaroyl tartaric acid.

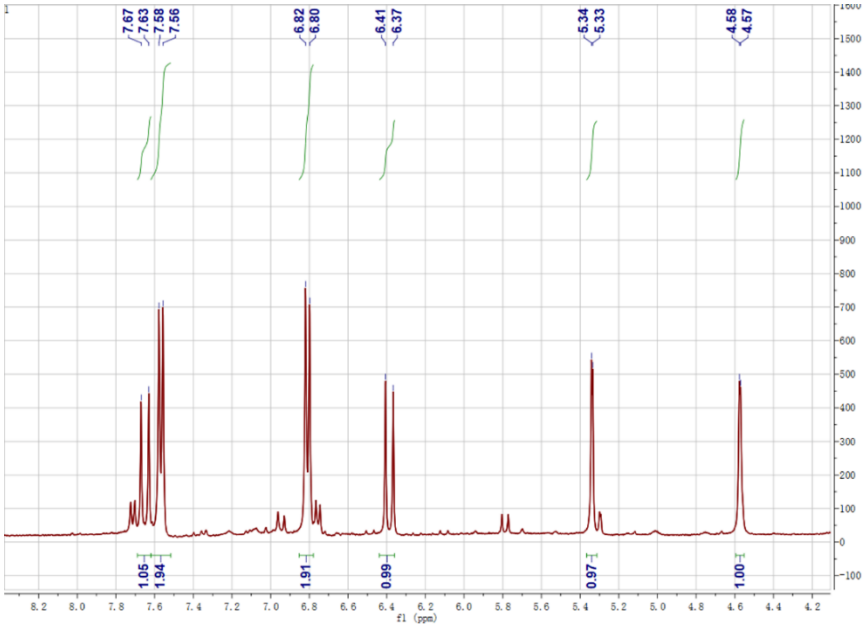
HPLC-MS



^{13}C-NMR



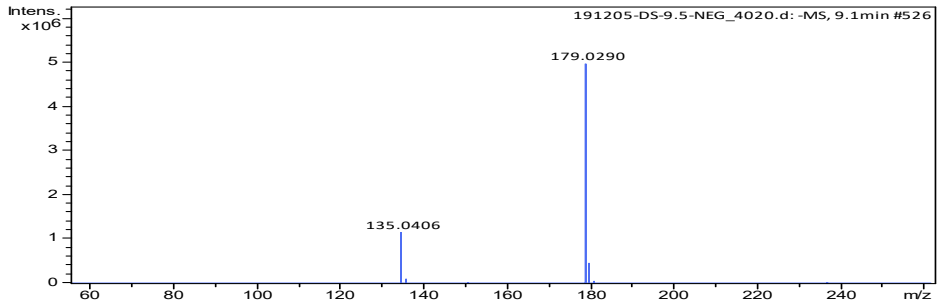
^{1}H-NMR



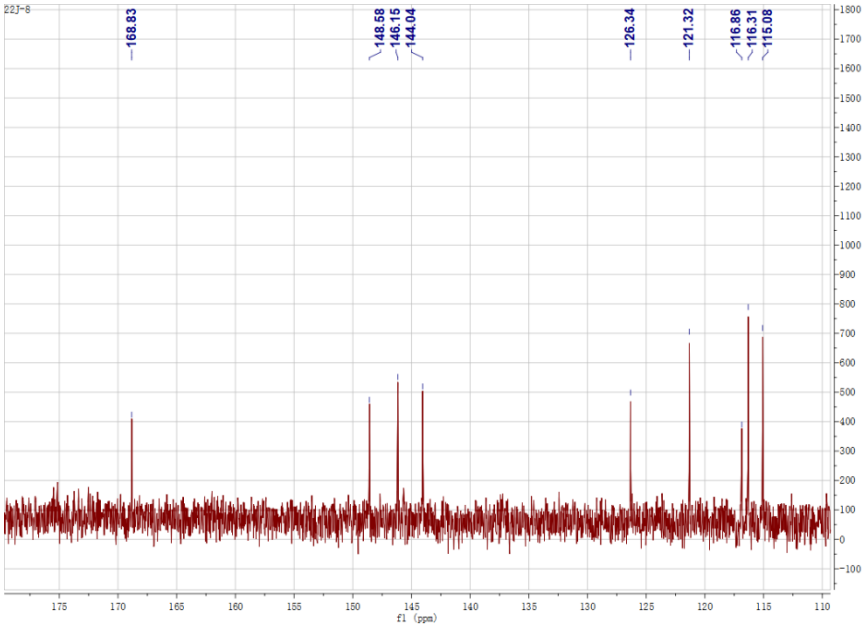
Compound IV

Negative ESI-MS, m/z 179.0290 $[M–H]^{–}$. ^{1}H-NMR (DMSO-d_6, 400 MHz) δ (ppm): 7.34 (1H, d, J = 16.0 Hz, H-8′), 7.00 (1H, s, H-2), 6.92 (1H, d, J = 8.0 Hz, H-6), 6.74 (1H, d, J = 8.0 Hz, H-5), 6.16 (1H, d, J = 16.0 Hz, H-8); ^{13}C-NMR (DMSO-d_6, 100 MHz) δ (ppm): 168.8.8 (C-9), 148.6 (C-4), 146.1 (C-3), 144.0 (C-7), 126.3 (C-1), 121.3 (C-6), 116.9 (C-8), 116.3 (C-5), 115.1 (C-2). By comparison with the reported data,[18] compound IV was identified as caffeic acid.

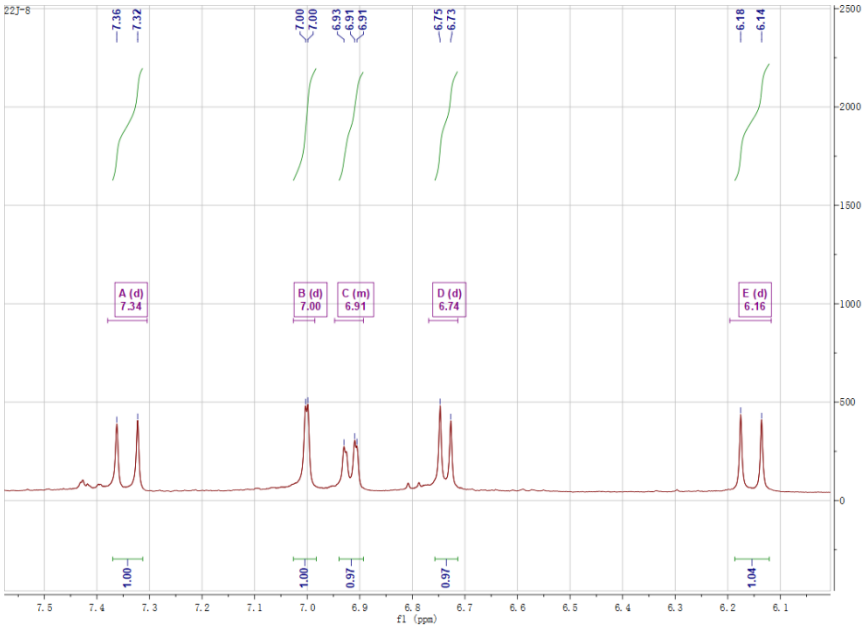
HPLC-MS



^{13}C-NMR



^{1}H-NMR

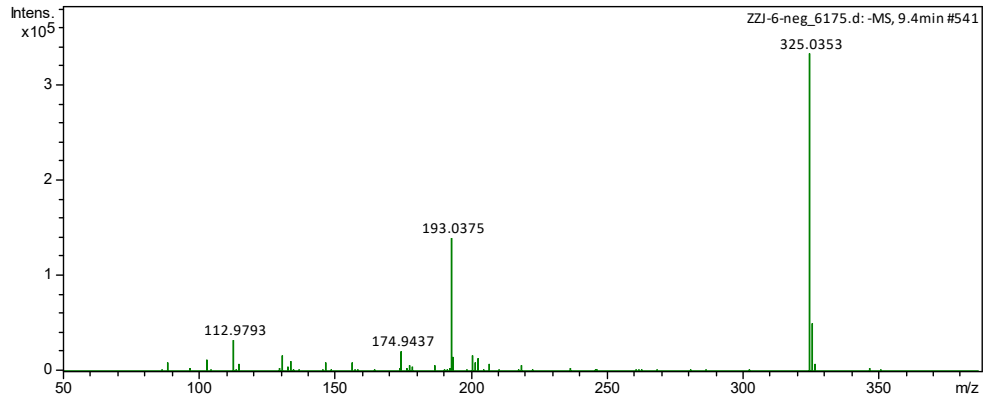


Compound V

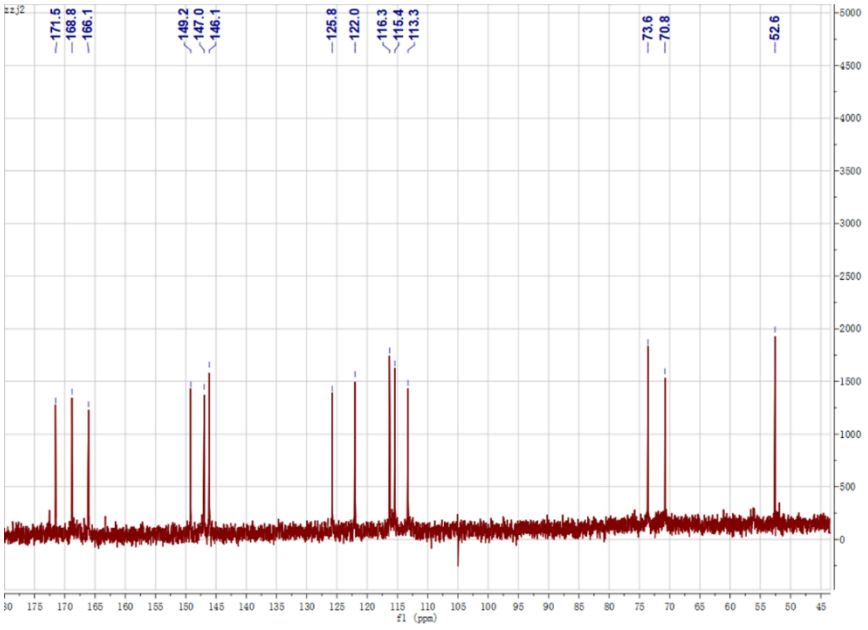
Negative ESI-MS, m/z 325.0353 $[M–H]^-$. ^{1}H-NMR (DMSO-d_6, 400 MHz) δ (ppm): 7.57 (1H, d, J = 16.0 Hz, H-7′), 7.06 (1H, s, H-2′), 7.03 (1H, d, J = 8.0 Hz, H-6′), 6.79 (1H, d, J = 8.0 Hz, H-5′), 6.25 (1H, d, J = 16.0 Hz, H-8′), 5.34 (1H, s, H-2), 4.71 (1H, s, H-3), 3.65 (3H, s, -OCH_3); ^{13}C-NMR (DMSO-d_6, 100 MHz) δ (ppm): 171.5 (C-4), 168.8 (C-1), 166.1 (C-9′), 149.2 (C-4′), 147.0 (C-7′), 146.1 (C-3′), 125.8 (C-1′), 122.0

(C-6′), 116.3 (C-5′), 115.4 (C-2′), 113.3 (C-6′), 73.6 (C-2), 70.8 (C-3), 52.6 (-OCH_3). By comparison with reported data,[23] compound V was identified as caffeoyl tartaric acid methyl ester.

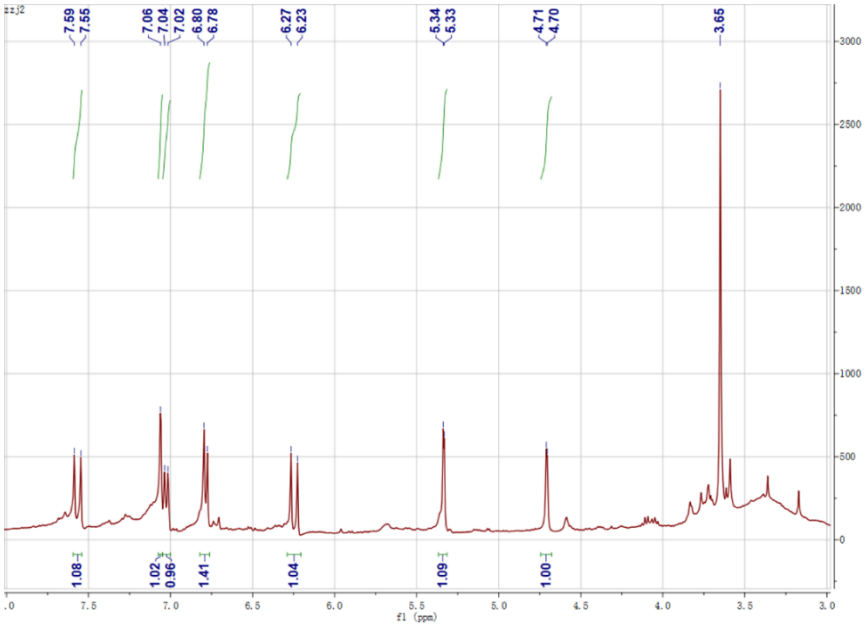
HPLC-MS



^{13}C-NMR



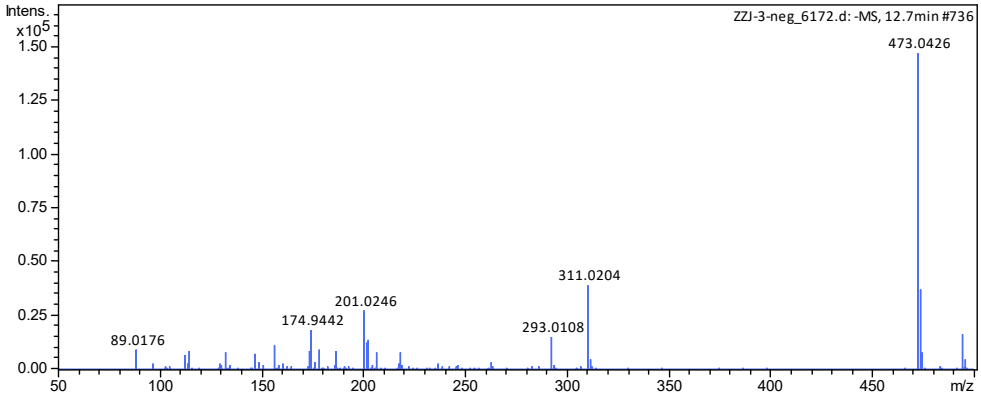
^{1}H-NMR



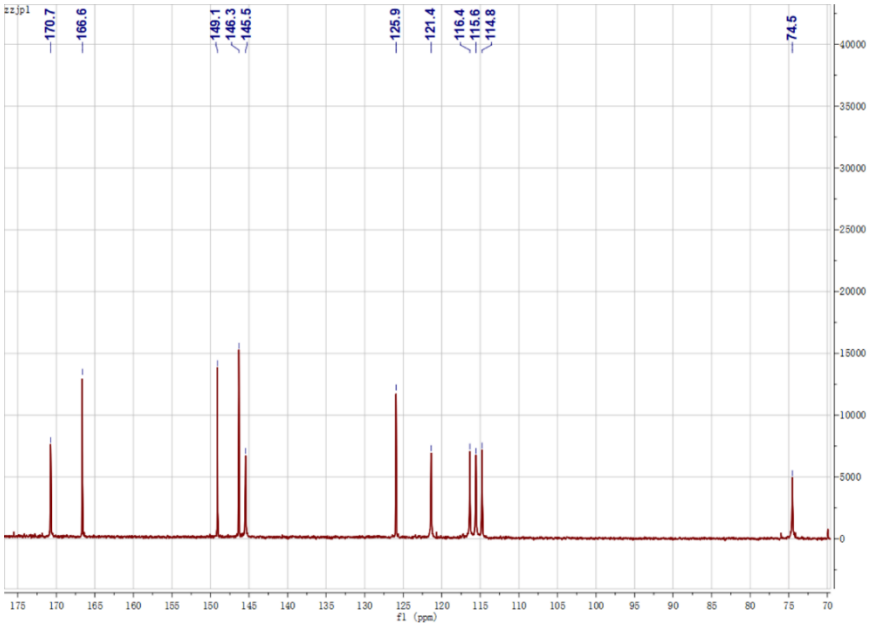
Compound VI

Negative ESI-MS, m/z 473.0426 $[M–H]^{–}$. ^{1}H-NMR (DMSO-d_6, 400 MHz) δ (ppm): 7.42 (2H, d, J = 16.0 Hz, H-7′, 7′′), 7.10 (2H, br s, H-2′, 2′ ′), 6.90 (2H, J = 8.0 Hz, H-6′, 6′′), 6.76 (2H, d, J = 8.0 Hz, H-5′, 5′′), 6.30 (2H, d, J = 16.0 Hz, H-8′, 8′′), 5.54 (2H, br s, H-2, 3); ^{13}C-NMR (DMSO-d_6, 100 MHz) δ (ppm): 170.2 (C-1, 4), 166.4 (C-9′, 9′′), 148.9 (C-3′, 3′′), 146.3 (C-7′, 7′′), 145.5 (C-4′, 4′′), 126.0 (C-1′, 1′′), 121.7 (C-6′, 6′′), 116.1 (C-2′, 2′′), 115.1 (C-5′, 5′′), 114.7 (C-8′, 8′′), 70.8 (C-2, 3). By comparison with reported data,[24] compound VI was identified as 2,3-O-dicaffeoyl tartaric acid (cichoric acid).

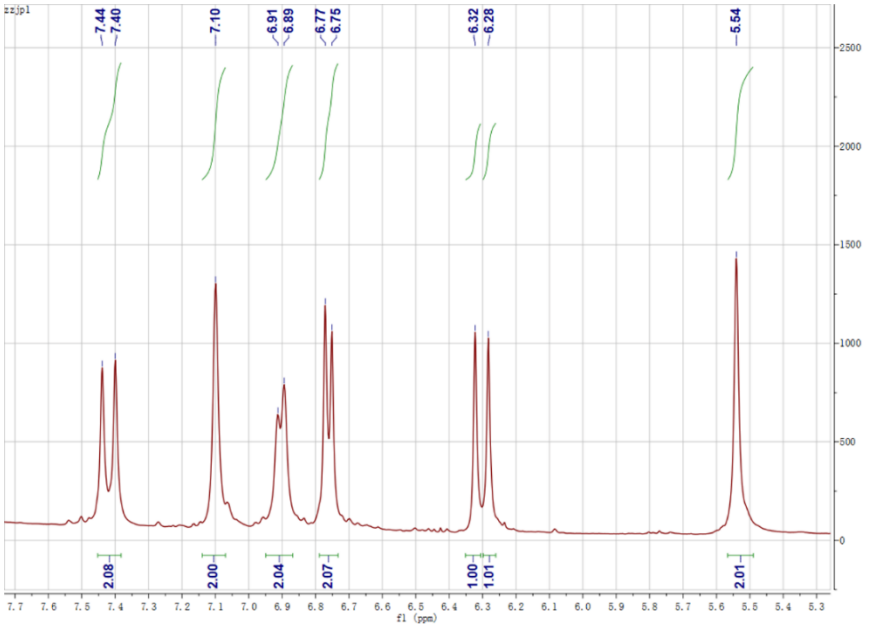
HPLC-MS



^{13}C-NMR



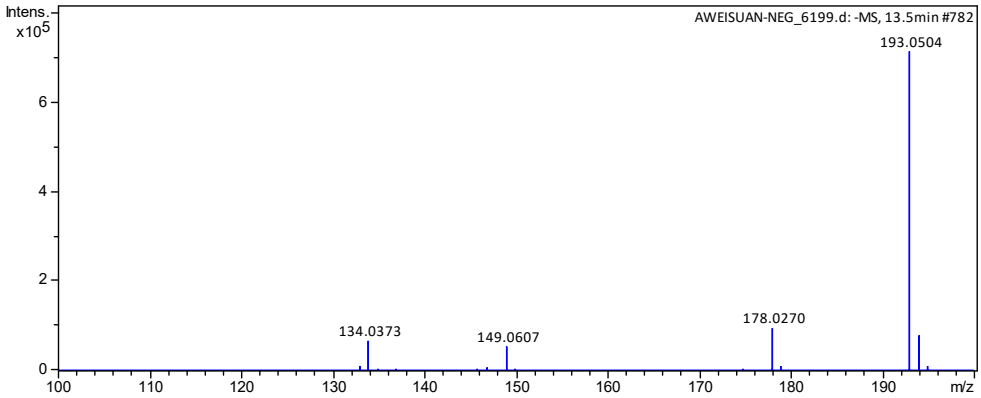
^{1}H-NMR



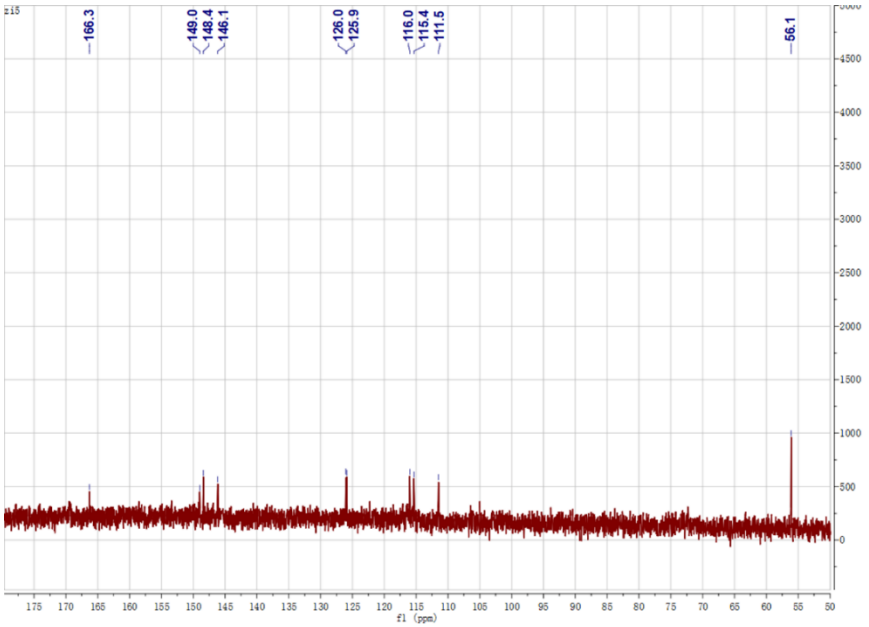
Compound VII

Negative ESI-MS, m/z 193.0504 $[M–H]^-$. ^{1}H-NMR (DMSO-d_6, 400 MHz) δ (ppm): 7.46 (1H, d, J = 12.0 Hz, H-7), 7.27 (1H, s, H-2), 7.06 (1H, d, J = 8.0 Hz, H-6), 6.74 (1H, d, J = 8.0 Hz, H-5), 6.22 (1H, d, J = 16.0 Hz, H-8), 3.78 (3H, s, -OCH_3); ^{13}C-NMR (DMSO-d_6, 100 MHz) δ (ppm): 166.3 (C-9), 149.0 (C-3), 148.4 (C-4), 146.1 (C-7), 126.0 (C-1), 125.9 (C-6), 116.0 (C-8), 115.4 (C-5), 111.5 (C-2), 56.1 (-OCH_3). By comparison with reported data,[25] compound VII was identified as ferulic acid.

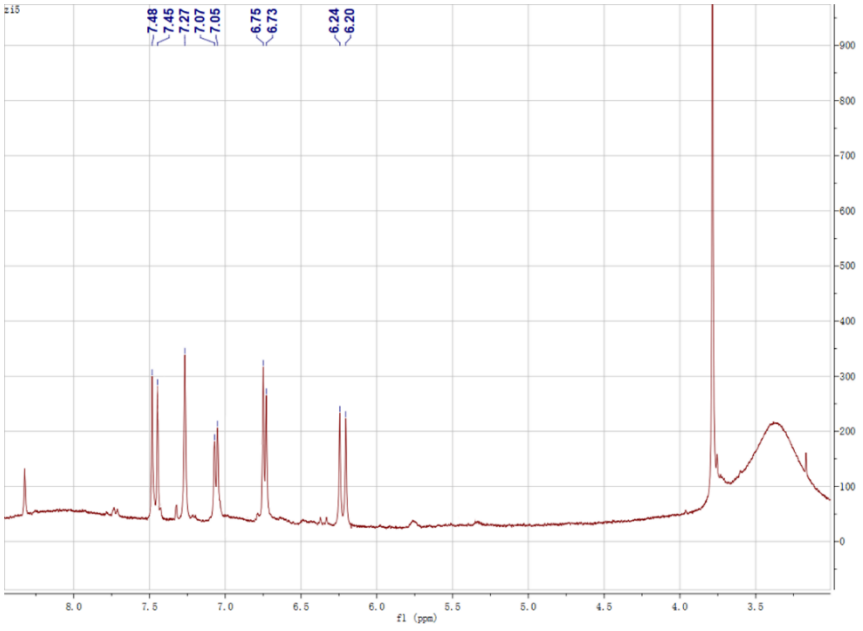
HPLC-MS



^{13}C-NMR



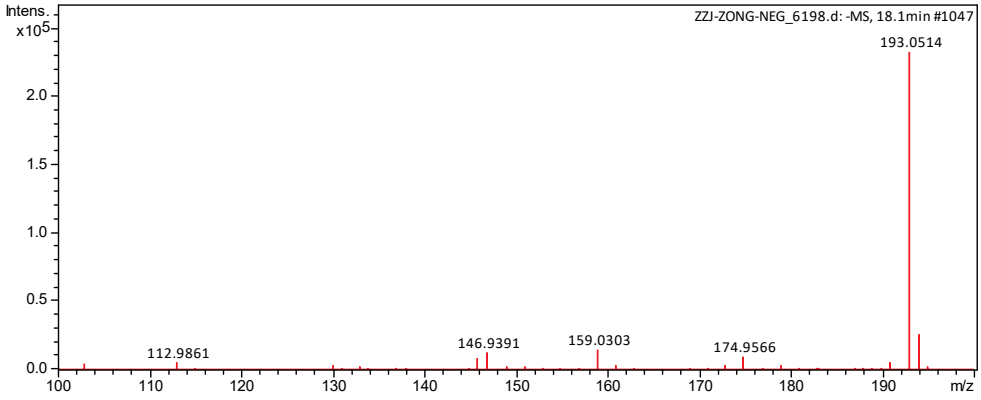
^{1}H-NMR



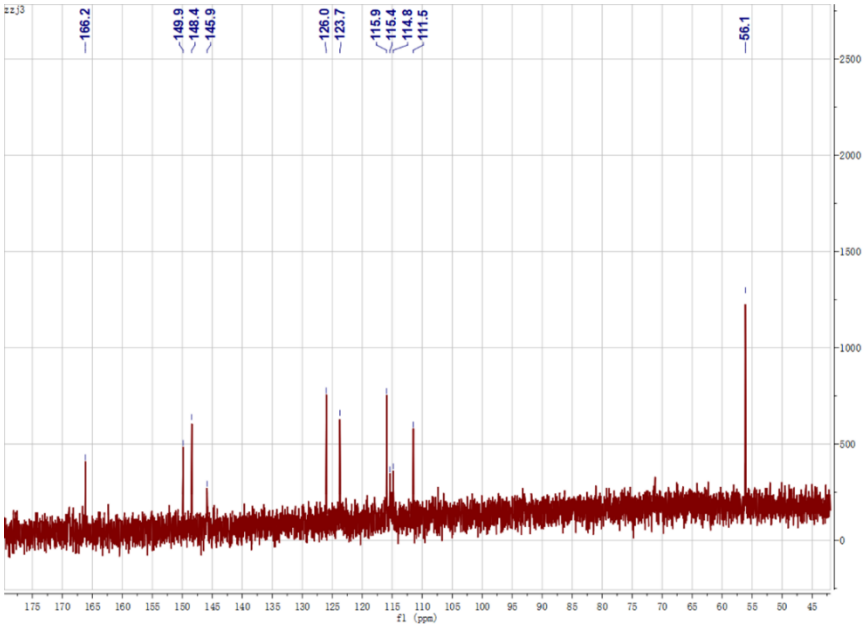
Compound VIII

Negative ESI-MS, m/z 193.0514 $[M–H]^-$. ^{1}H-NMR (DMSO-d_6, 400 MHz) δ (ppm): 7.53 (1H, d, J = 12.0 Hz, H-7), 7.29 (1H, s, H-2), 7.07 (1H, d, J = 8.0 Hz, H-6), 6.76 (1H, d, J = 8.0 Hz, H-5), 6.47 (1H, d, J = 16.0 Hz, H-8), 3.78 (3H, s, -OCH_3); ^{13}C-NMR (DMSO-d_6, 100 MHz) δ (ppm): 166.2 (C-9), 149.9 (C-4), 148.4 (C-7), 145.9 (C-3), 126.0 (C-1), 123.7 (C-6), 115.9 (C-2), 114.8 (C-5), 111.5 (C-2), 56.1 (-OCH_3). By comparison with reported data,[26] compound VIII was identified as caffeic acid methyl ester.

HPLC-MS



^{13}C-NMR



^{1}H-NMR

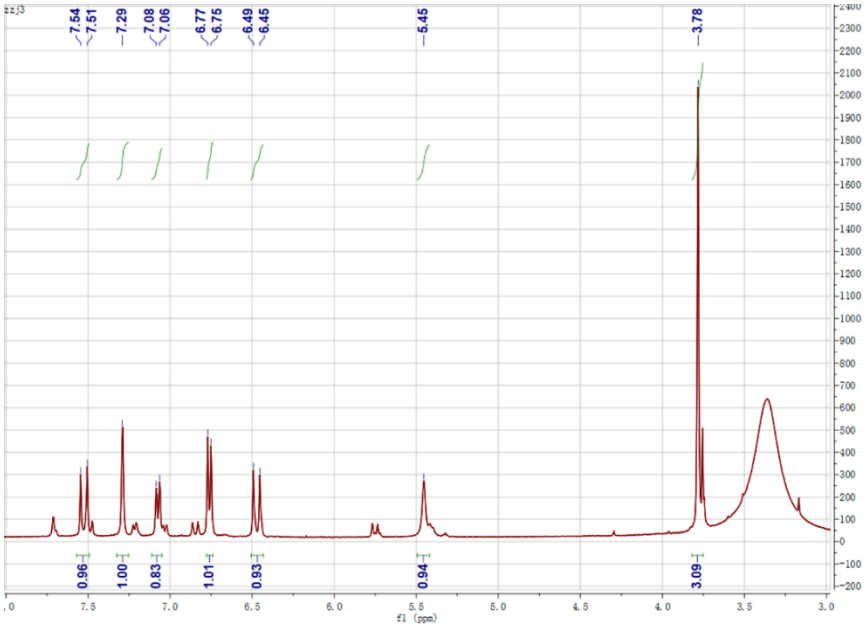


Table S1 Cell viability of the RAW 264.7 cells treated with compound I-VIII

Compound	Cell viability			
	400 μmol·L^{-1}	200 μmol·L^{-1}	100 μmol·L^{-1}	50 μmol·L^{-1}
I	100.80%	105.79%	106.55%	107.96%
II	108.89%	108.19%	109.47%	102.86%
III	97.24%	106.22%	107.77%	108.60%
IV	98.56%	103.11%	102.99%	102.92%
V	95.21%	94.61%	102.26%	105.02%
VI	102.41%	102.04%	103.30%	105.42%
VII	98.25%	100.18%	102.74%	102.97%
VIII	103.15%	107.15%	106.98%	109.84%

Table S2 Cell viability of the RAW 264.7 cells treated with the extract

Concentration	400 μg·L^{-1}	200 μg·L^{-1}	100 μg·L^{-1}	50 μg·L^{-1}
Cell viability	109.53%	108.84%	107.73%	109.86%

Table S3 Cell viability of the RAW 264.7 cells treated with DMSO

Concentration	5 μL·mL^{-1}	4 μL·mL^{-1}	3 μL·mL^{-1}	2 μL·mL^{-1}
Cell viability	109.42%	109.42%	104.74%	100.10%

Table S4 Cell viability of the RAW 264.7 cells treated with binary combination and the CI values of binary combination

Combination	Concentration (μmol·L^{-1})		Cell viability	CI
	(Drug 1)	(Drug 2)		
Compound I+VI	400	100	95.25%	1.17391
	200	50	101.57%	0.71890
	100	25	97.11%	0.39358
	50	12.5	101.86%	0.20126
Compound II+VI	400	100	105.32%	1.06751
	200	50	103.65%	0.73102
	100	25	102.15%	0.41687
	50	12.5	108.15%	0.22283
	200	100	91.57%	0.97583

Compound IV+VI	100	50	97.79%	0.73910
	50	25	107.57%	0.40952
	25	12.5	106.77%	0.24922
Compound VIII+VI	400	200	100.21%	1.52980
	200	100	95.07%	0.76728
	100	50	95.43%	0.46610
	50	25	99.87%	0.23225

Table S5 Cell viability of the RAW 264.7 cells treated with ternary combination and the CI values of ternary combination

Combination	Dose (μmol·L^{-1})			Cell viability	CI
	(Drug 1)	(Drug 2)	(Drug 3)		
Compound I+II+VI	400	400	100	96.51%	0.73323
	200	200	50	95.38%	0.54053
	100	100	25	108.72%	0.52945
	50	50	12.5	90.92%	0.30606
Compound I+IV+VI	400	200	100	98.12%	0.89678
	200	100	50	91.42%	0.69776
	100	50	25	97.86%	0.50165
	50	25	12.5	102.25%	0.31728
Compound I+VIII+VI	400	400	100	90.83%	1.44668
	200	200	50	103.41%	0.88787
	100	100	25	103.27%	0.53728
	50	50	12.5	109.27%	0.29979
Compound II+IV+VI	400	200	100	91.92%	0.75704
	200	100	50	94.25%	0.75150
	100	50	25	97.77%	0.51872
	50	25	12.5	106.61%	0.33988
Compound II+VIII+VI	400	400	100	94.95%	1.22220
	200	200	50	96.86%	0.86557
	100	100	25	98.24%	0.58591
	50	50	12.5	103.07%	0.47681
Compound VI+VIII+VI	200	400	100	109.53%	1.66611
	100	200	50	104.98%	1.05460
	50	100	25	92.75%	0.68519
	25	50	12.5	101.05%	0.39716