Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Polymer incarcerated Palladium catalyzed facile *in situ* carbonylation for the synthesis of aryl aldehydes and diaryl ketones using CO surrogates at ambient conditions

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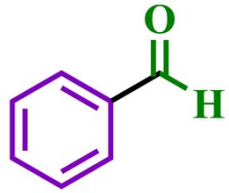
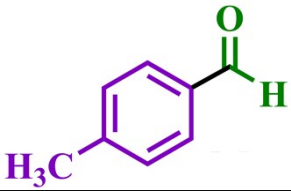
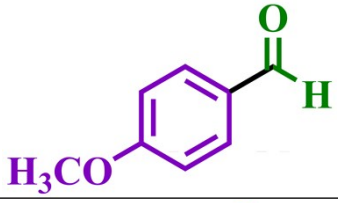
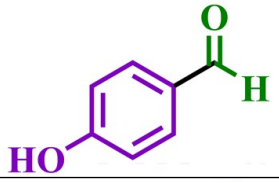
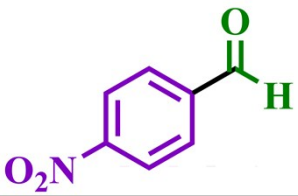
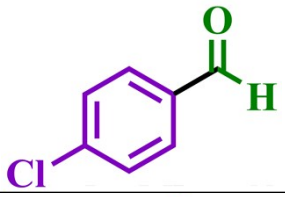
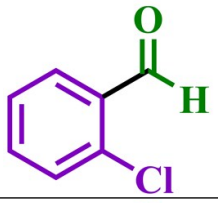
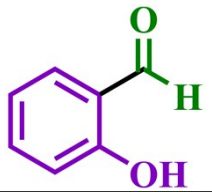
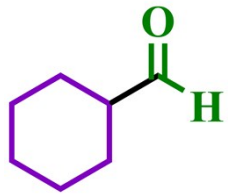
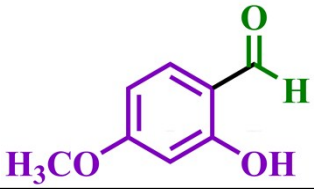
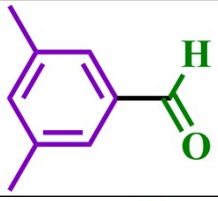
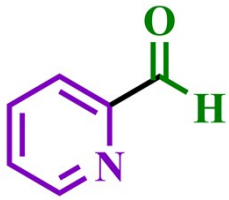
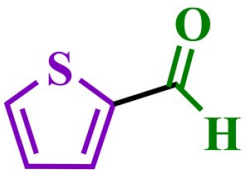
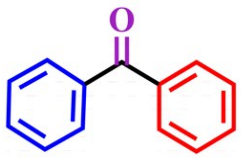
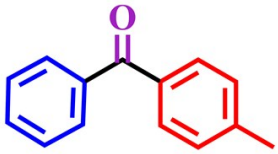
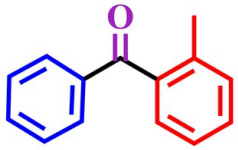
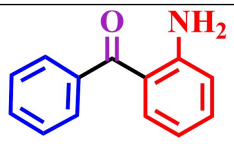
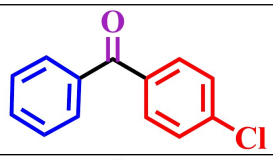
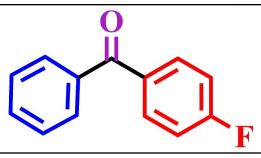
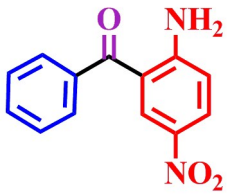
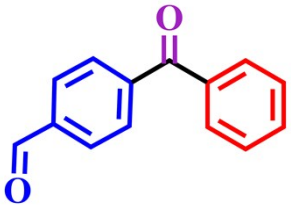
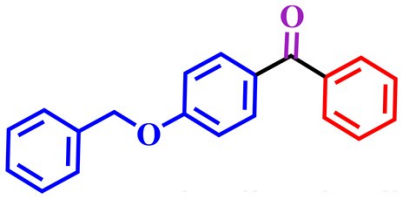
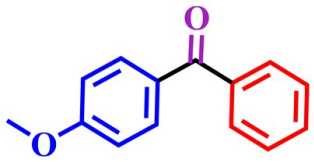
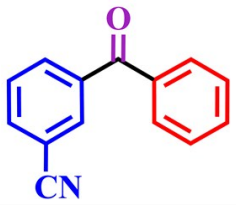
1. *[1]HNMR data of insitu carbonylative products*

	[1]HNMR (400 MHz, $CDCl_3$): δ7.445-7.539 (m, 2H), 7.582-7.644 (m, 1H), 7.865-7.886 (m, 2H), 10.008 (s, 1H) ppm.
	[1]HNMR (400 MHz, $CDCl_3$): δ2.441 (s, 3H), 7.322-7.342 (d, *J*=8 Hz, 2H), 7.769-7.789 (t, *J*=7.2 Hz, 2H), 9.965 (s, 1H) ppm.
	[1]HNMR (400 MHz, $CDCl_3$): δ3.892 (s, 3H), 6.991-7.018 (m, 2H), 7.825-7.853 (m, 2H), 9.887 (s, 1H) ppm.
	[1]HNMR (400 MHz, $CDCl_3$): δ6.373 (s, 1H), 6.948-6.990 (m, 2H), 7.791-7.840 (m, 2H), 9.865 (s, 1H) ppm.
	[1]HNMR (400 MHz, $CDCl_3$): δ8.004-8.026 (m, 2H), 8.325-8.346 (d, *J*=8.4 Hz, 2H), 10.128 (s, 1H) ppm.
	[1]HNMR (400 MHz, $CDCl_3$): δ7.529-7.550 (m, 2H), 7.828-7.860 (m, 2H), 10.005 (s, 1H) ppm.
	[1]HNMR (400 MHz, $CDCl_3$): δ7.276-7.367 (m, 2H), 7.423-7.465 (m, 1H), 7.815-7.839 (m, 1H), 10.386 (s, 1H) ppm.
	[1]HNMR (400 MHz, $CDCl_3$): δ6.967-7.029 (m, 2H), 7.495-7.557 (m, 2H), 9.878 (s, 1H), 11.026 (s, 1H) ppm.
	[1]HNMR (400 MHz, $CDCl_3$): δ7.766-7.845 (m, 2H), 7.968-7.991 (m, 1H), 8.135-8.158 (m, 1H), 10.448 (s, 1H) ppm.

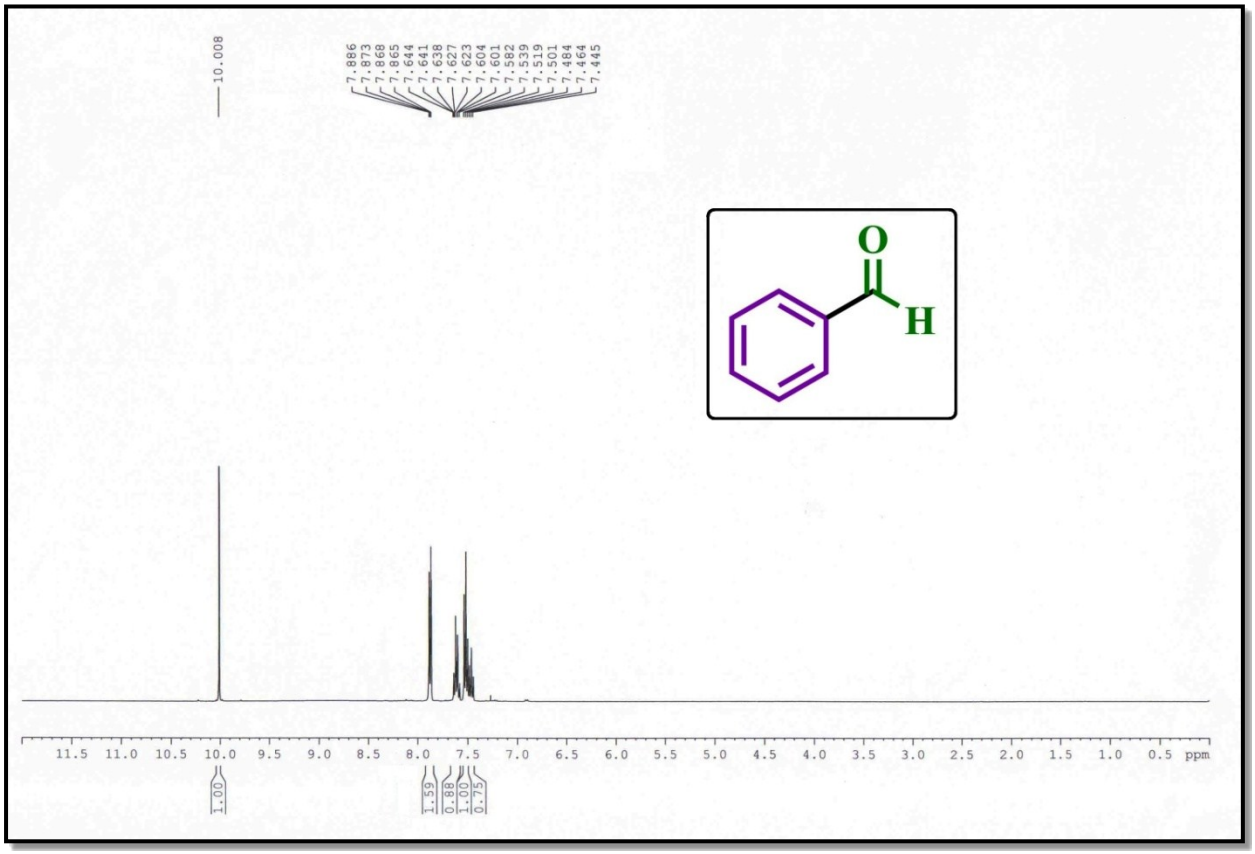
	^{1}HNMR (400 MHz, $CDCl_3$): δ1.320-1.508 (m, 5H), 1.646-1.669 (t, *J*=5.6 Hz, 1H), 1.752-1.789 (m, 2H), 1.930-1.961 (t, *J*=10.4 Hz, 2H), 2.297-2.371 (m, 1H)
	^{1}HNMR (400 MHz, $CDCl_3$): δ3.793 (s, 3H), 6.363-6.369 (d, *J*=2.4 Hz, 1H), 6.461-6.488 (m, 1H), 7.354-7.375 (d, *J*=8.4 Hz, 1H), 9.652 (s, 1H), 11.427 (s, 1H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ2.263 (s, 6H), 7.131 (s, 1H), 7.358 (s, 2H), 9.814 (s, 1H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ7.537-7.571 (m, 1H), 7.883-7.925 (m, 1H), 7.973-7.995 (m, 1H), 8.806-8.818 (d, *J*=4.8 Hz, 1H), 10.099 (s, 1H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ7.116-7.138 (t, *J*=4 Hz, 1H), 7.675-7.709 (m, 2H), 9.849 (s, 1H) ppm.

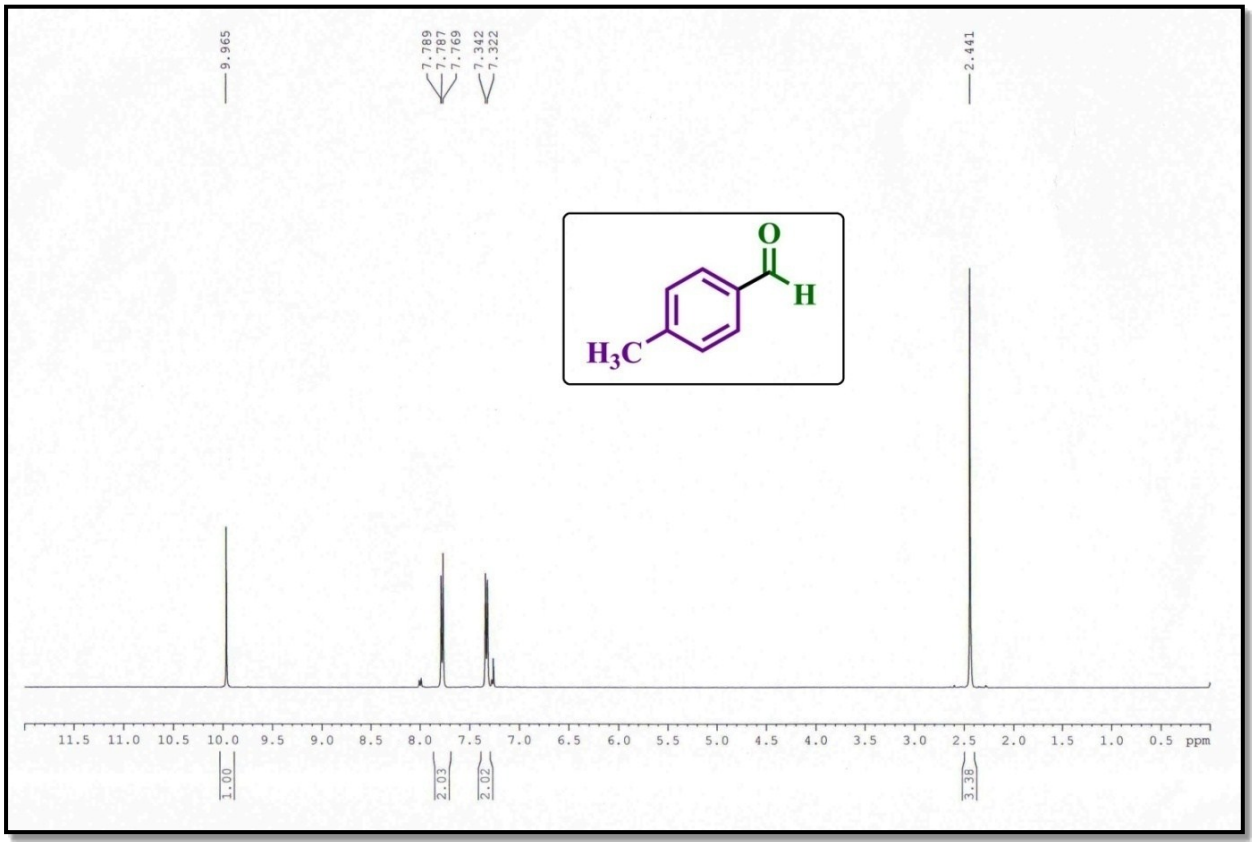
2. *^{1}HNMR data of diaryl ketone*

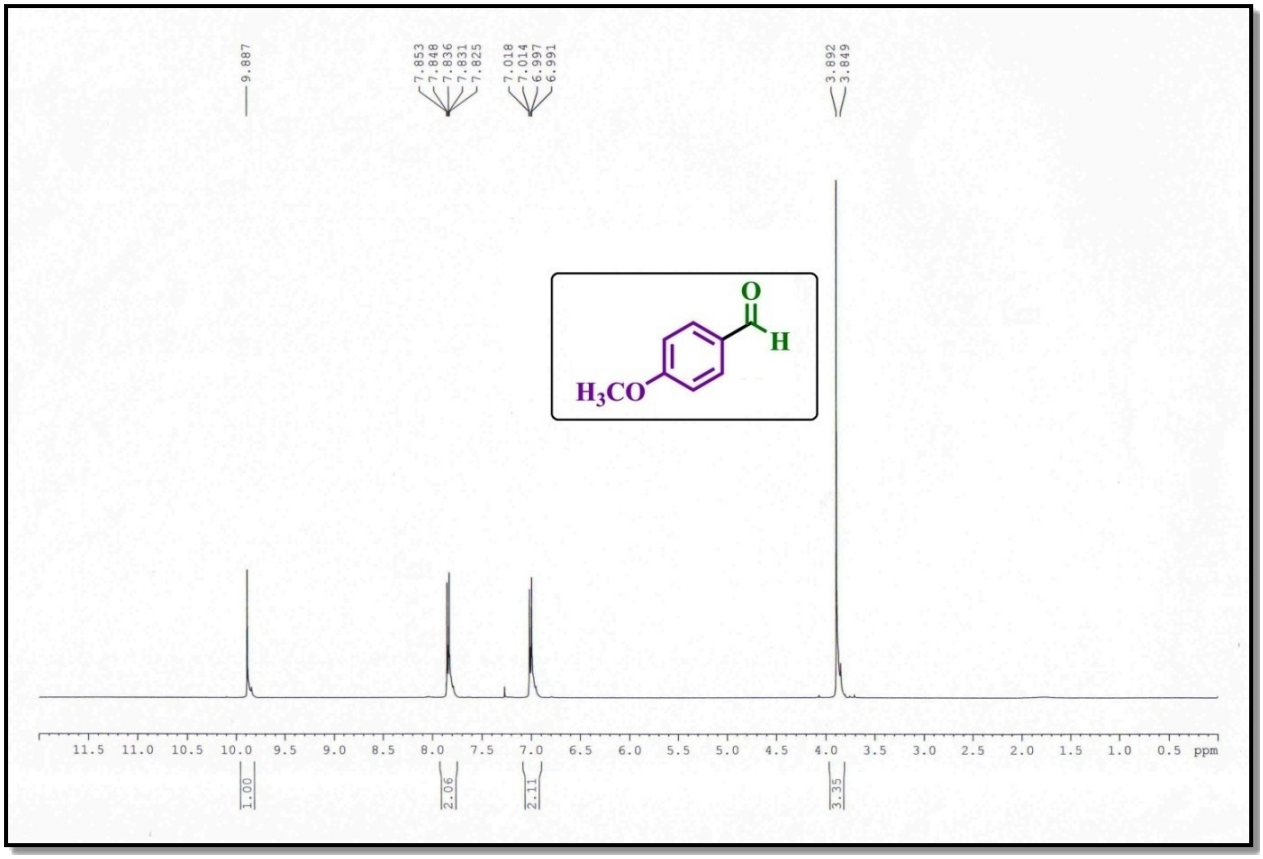
	^{1}HNMR (400 MHz, $CDCl_3$): δ7.312-7.350 (m, 4H), 7.418-7.460 (m, 2H), 7.604-7.676 (m, 4H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ2.589 (s, 3H), 7.398-7.435 (t, *J*=7.2 Hz, 2H), 7.476-7.537 (m, 3H), 7.592-7.629 (m, 2H), 7.732-7.750 (d, *J*=7.2 Hz, 2H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ2.373 (s, 3H), 7.322-7.462 (m, 5H), 7.495-7.552 (m, 2H), 7.658-7.676 (d, *J*=7.2 Hz, 2H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ6.136 (s, 2H), 6.607-6.645 (m, 1H), 6.749-6.770 (d, *J*=8.4 Hz, 1H), 7.282-7.335 (m, 1H), 7.457-7.496 (m, 3H), 7.527-7.571 (m, 1H), 7.653-7.676 (m, 2H) ppm.

	^{1}HNMR (400 MHz, $CDCl_3$): δ7.368-7.432 (m, 4H), 7.507-7.544 (t, *J*=7.2 Hz, 1H), 7.663-7.705 (m, 4H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ7.023-7.073 (m, 2H), 7.356-7.394 (m, 1H), 7.462-7.502 (m, 3H), 7.648-7.671 (t, *J*=8 Hz, 2H), 7.711-7.753 (m, 2H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ6.765-6.788 (d, *J*=9.2 Hz, 1H), 6.935 (s, 2H), 7.520-7.555 (t, *J*=6.8 Hz, 2H), 7.610-7.678 (m, 3H), 8.171-8.193 (d, *J*=8.8 Hz, 1H), 8.500 (s, 1H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ7.279-7.746 (m, 8H), 7.878-7.941 (m, 1H), 10.016 (s, 1H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ5.103-5.115 (d, *J*=4.8 Hz, 2H), 7.016-7.064 (m, 2H), 7.303-7.356 (m, 2H), 7.385-7.404 (m, 4H), 7.416-7.564 (m, 6H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ3.775 (m, 3H), 6.663-6.693 (m, 2H), 7.396-7.432 (t, *J*=7.2 Hz, 2H), 7.535-7.566 (m, 3H), 7.730-7.749 (d, *J*=7.6 Hz, 2H) ppm.
	^{1}HNMR (400 MHz, $CDCl_3$): δ7.489-7.699 (m, 4H), 7.771-7.889 (m, 3H), 8.037-8.060 (m, 2H) ppm.

3. *[1]HNMR copies of insitu carbonylative products*



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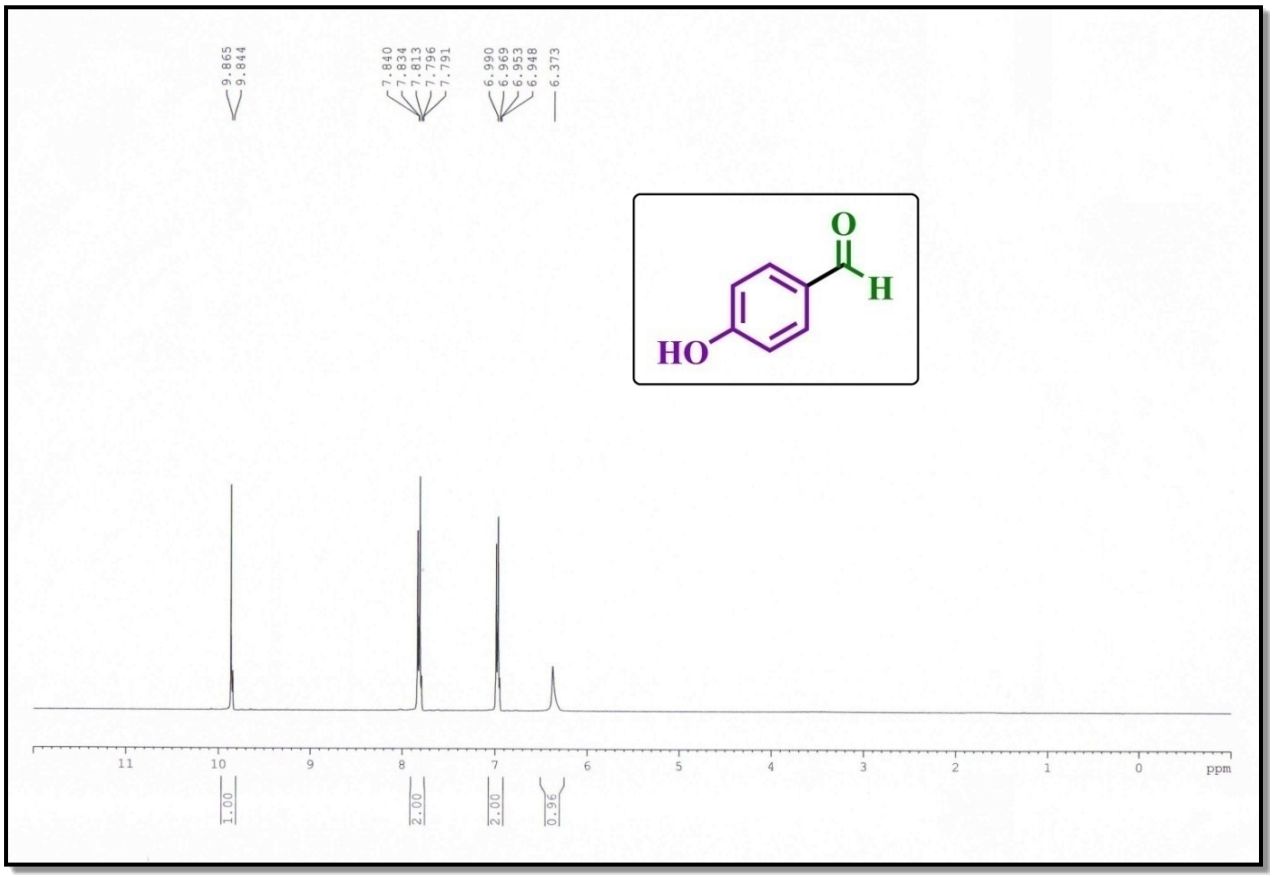
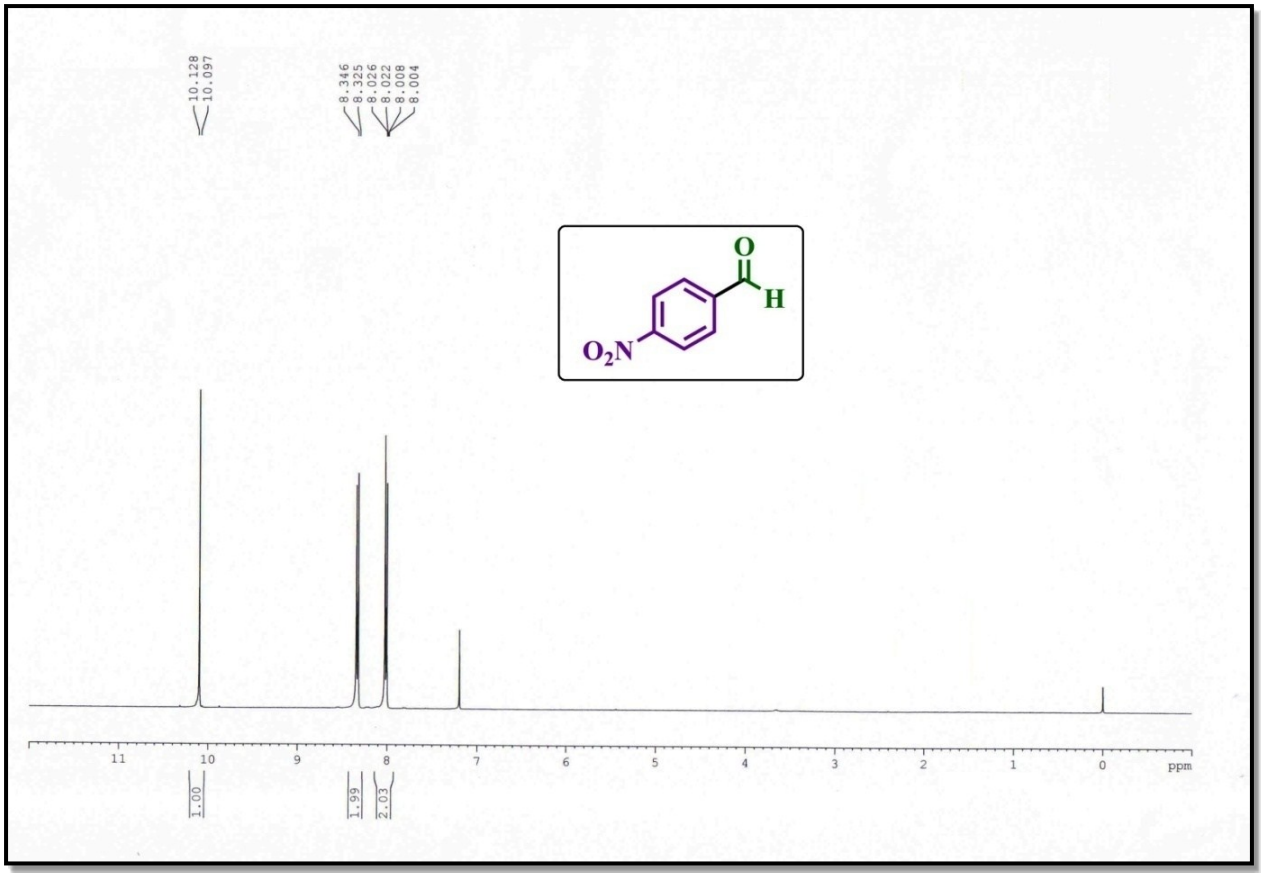
7.853
7.848
7.836
7.831
7.825
7.018
7.014
6.997
6.991
3.892
3.849
O
H
H3CO
11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.00
2.06
2.11
3.35

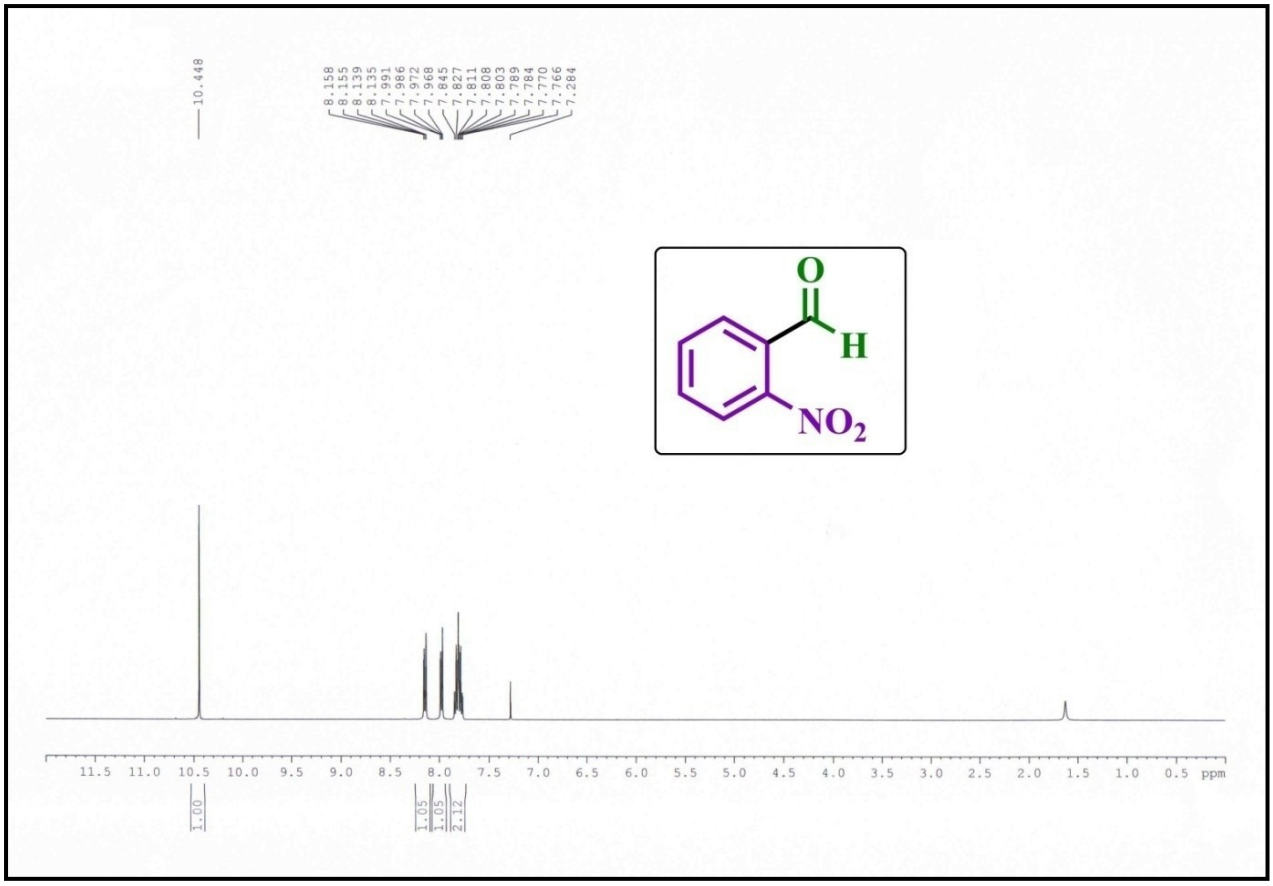

9.865
9.844
7.840
7.834
7.813
7.796
7.791
6.990
6.969
6.953
6.948
6.373
O
H
HO
11 10 9 8 7 6 5 4 3 2 1 0 ppm
1.00
2.00
2.00
0.96

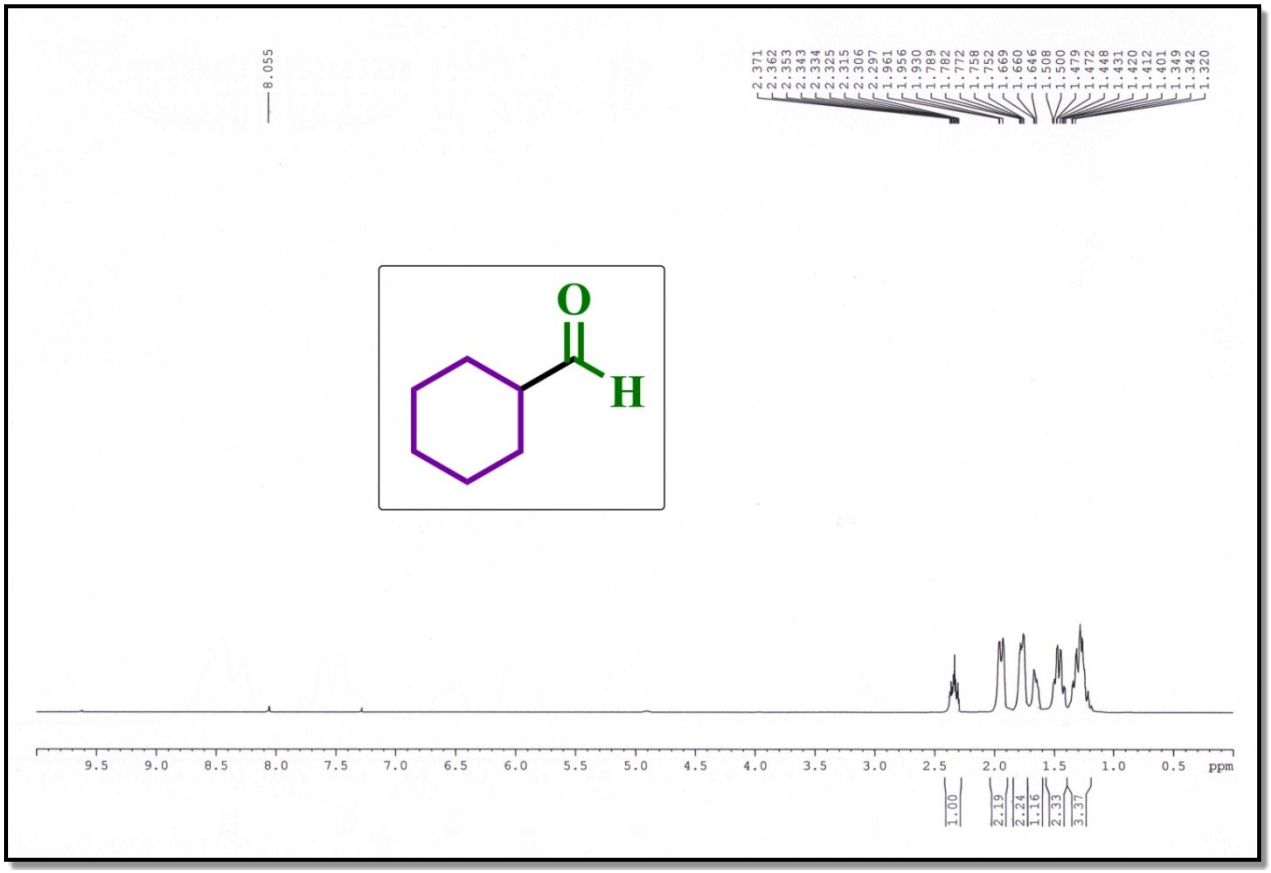

10.128
10.097
8.346
8.325
8.026
8.022
8.008
8.004
O
H
O2N
11
10
9
8
7
6
5
4
3
2
1
0
ppm
1.00
1.99
2.03

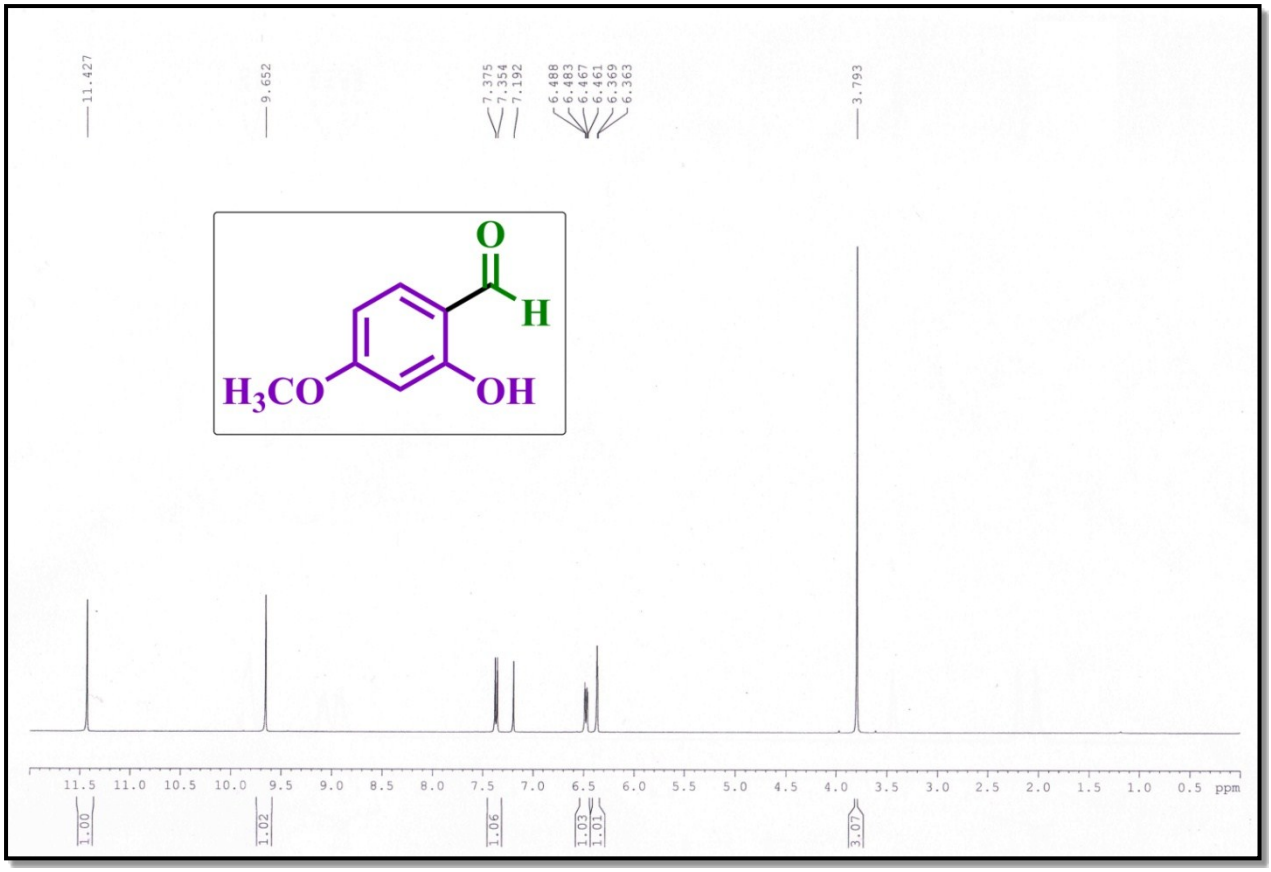

10.005
9.994
7.860
7.856
7.848
7.844
7.839
7.834
7.828
7.550
7.545
7.538
7.533
7.529
7.285
O
H
Cl
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
1.00
2.02
2.00

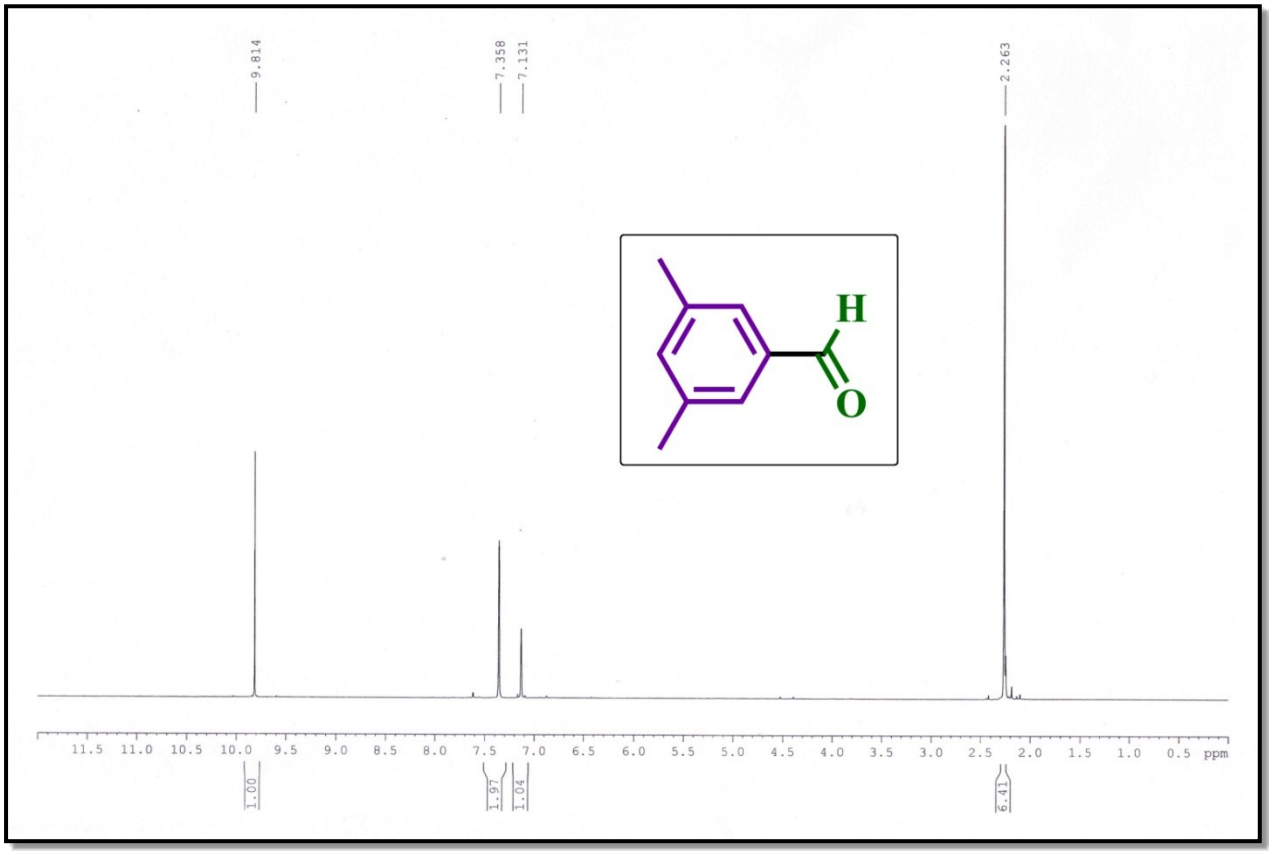

10.386
7.839
7.835
7.819
7.815
7.465
7.461
7.445
7.442
7.427
7.423
7.367
7.349
7.347
7.316
7.297
7.278
7.276
O
H
Cl
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
ppm
1.00
1.04
1.04
1.06
1.07


11.026
9.878
9.866
7.557
7.554
7.537
7.535
7.518
7.516
7.498
7.495
7.029
7.010
6.989
6.967
O
H
OH
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm
1.00
1.02
2.07
2.04

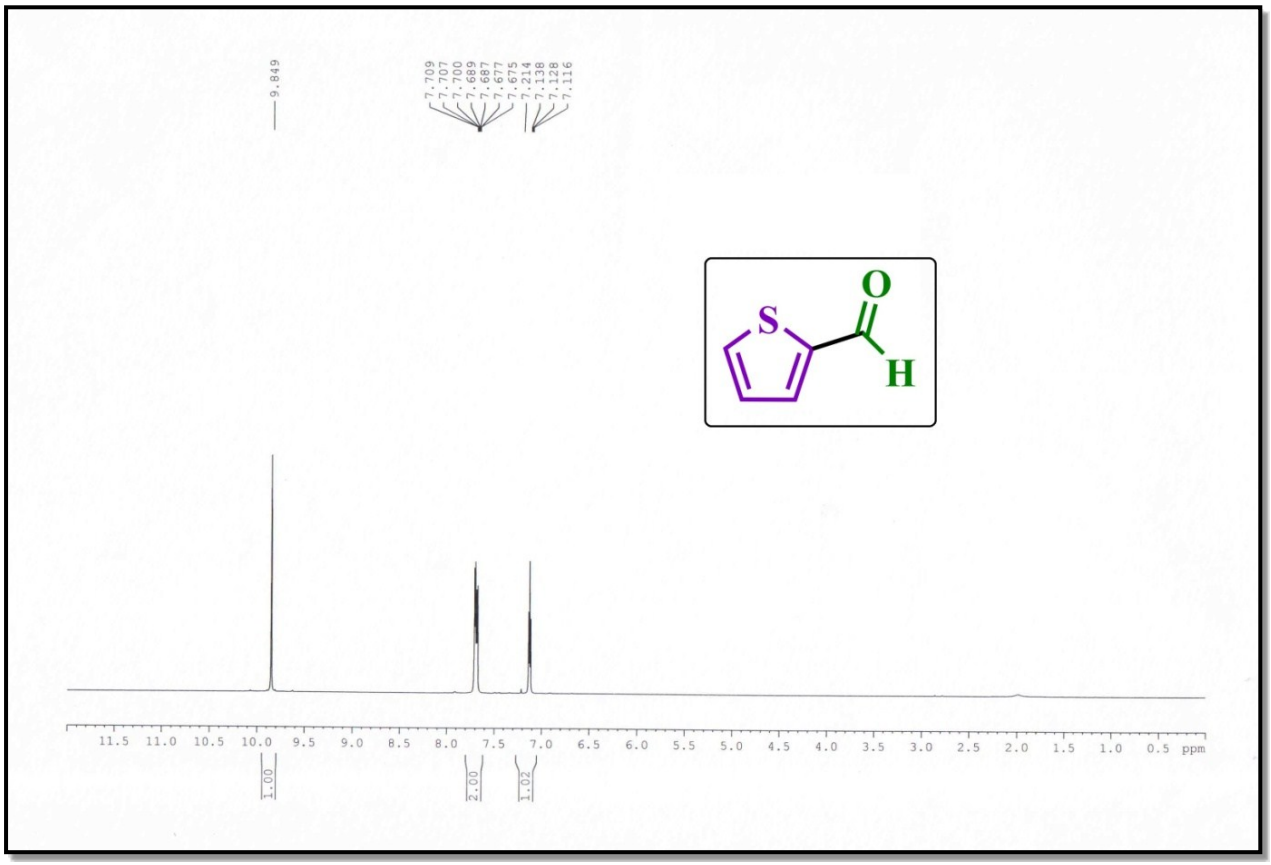

10.448
8.158
8.155
8.139
8.135
7.991
7.986
7.972
7.968
7.845
7.827
7.811
7.808
7.803
7.789
7.784
7.770
7.766
7.284
O
H
NO2
11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.00
1.05
1.05
2.12


8.055
2.371
2.362
2.353
2.343
2.334
2.325
2.315
2.306
2.297
1.961
1.956
1.930
1.789
1.782
1.772
1.758
1.752
1.669
1.660
1.646
1.508
1.500
1.479
1.472
1.448
1.431
1.420
1.412
1.401
1.349
1.342
1.320
O
H
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.00
2.19
2.24
1.16
2.33
3.37

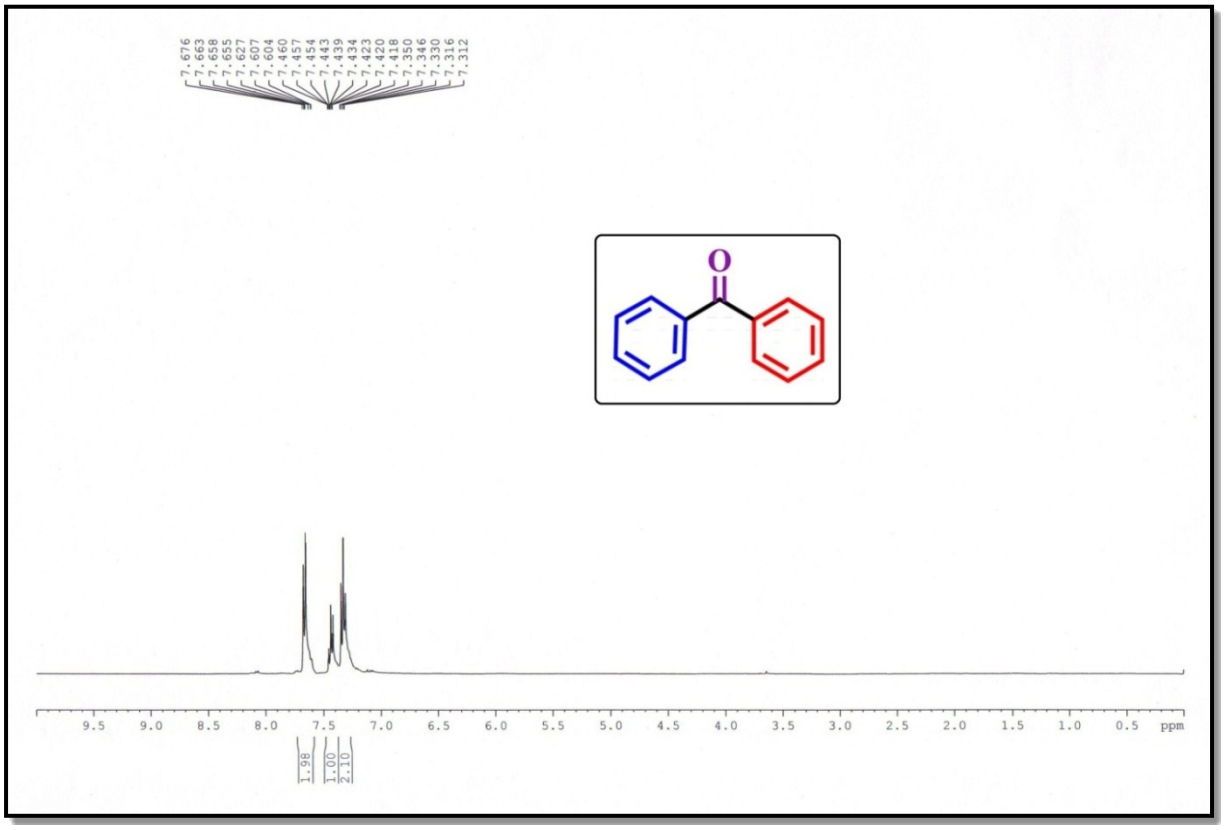

11.427
9.652
7.375
7.354
7.192
6.488
6.483
6.467
6.461
6.369
6.363
3.793
O
H
H3CO
OH
11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.00
1.02
1.06
1.03
1.01
3.07

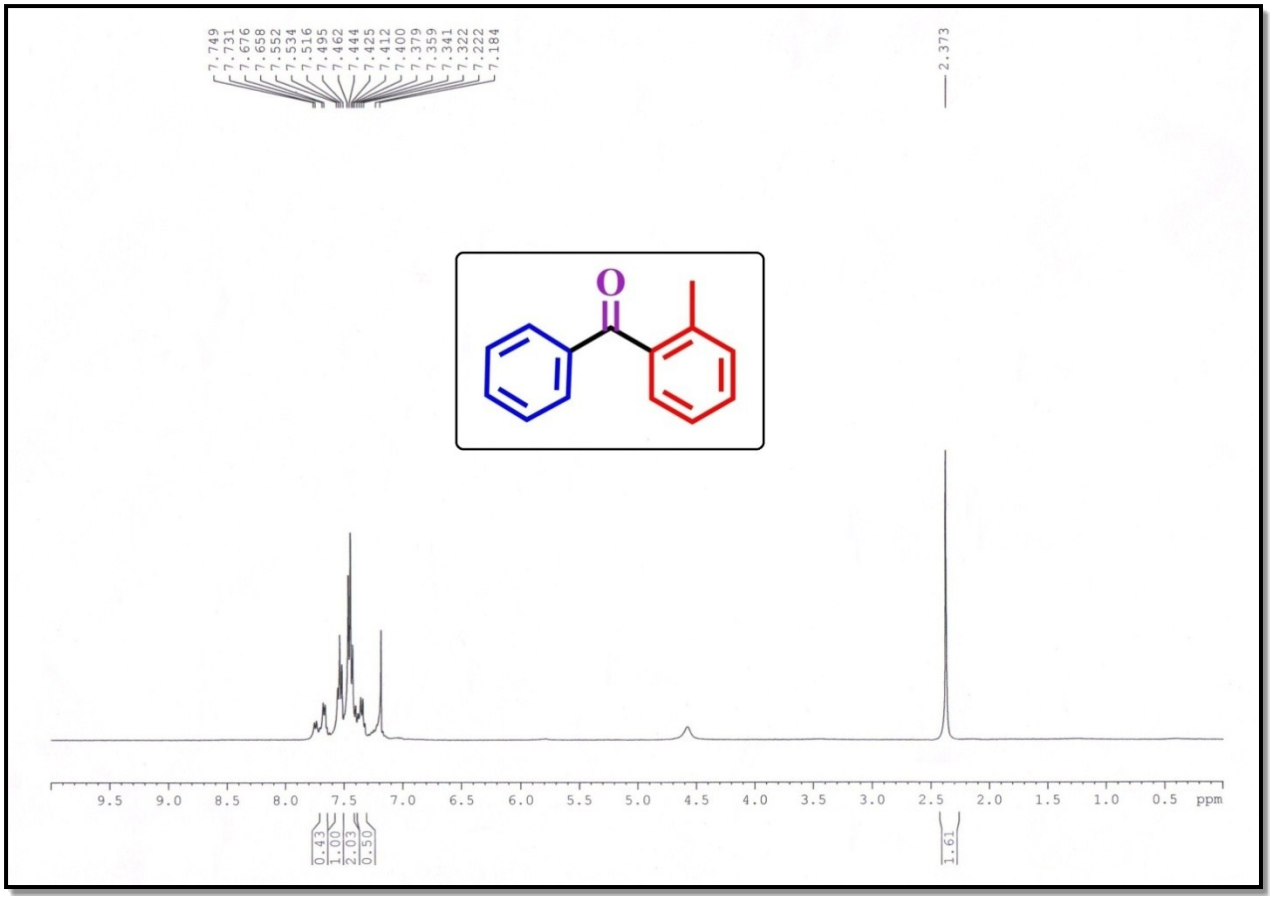

9.814
7.358
7.131
2.263
H
O
11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.00
1.97
1.04
6.41

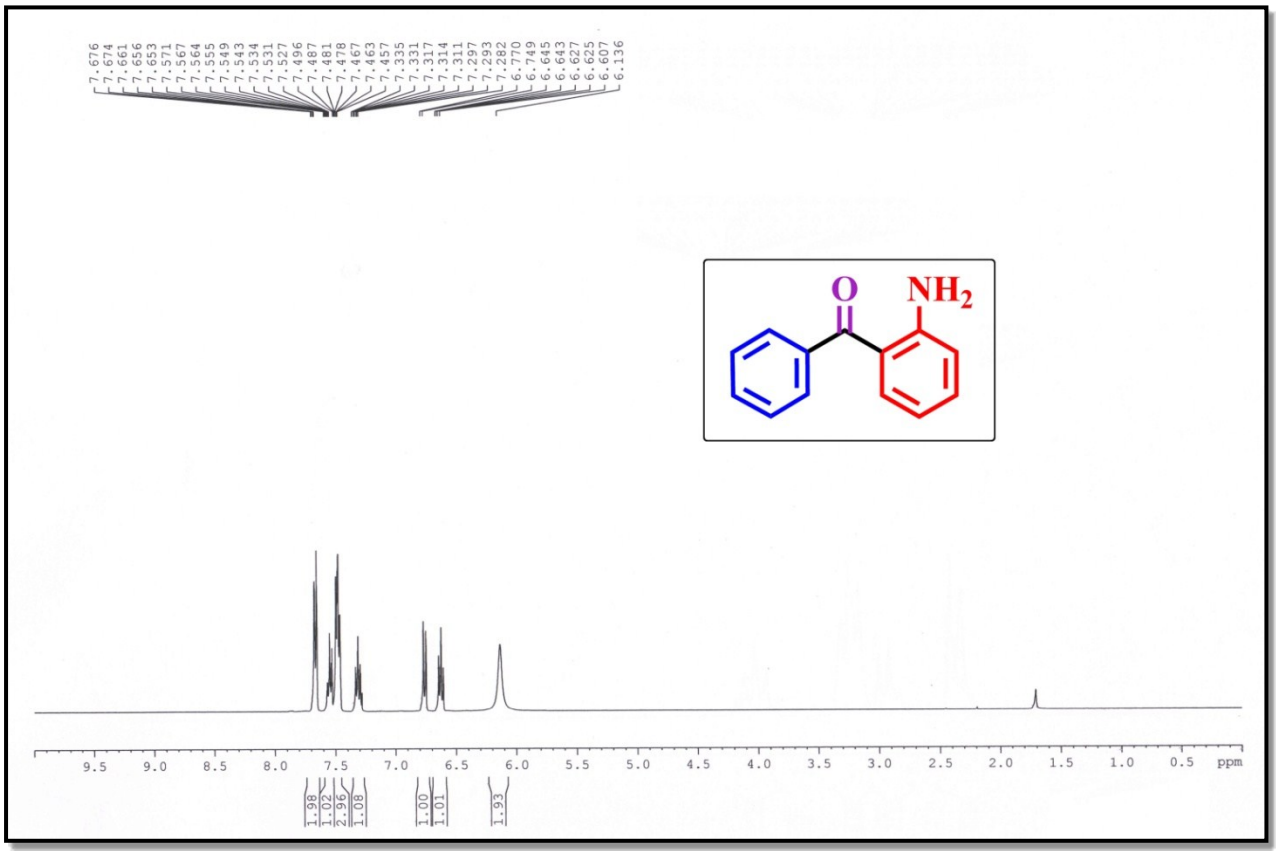

10.099
8.818
8.806
7.995
7.992
7.990
7.975
7.973
7.925
7.922
7.904
7.886
7.883
7.571
7.568
7.559
7.556
7.552
7.549
7.540
7.537
O
H
N
11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.00
1.03
1.06
1.20
1.14

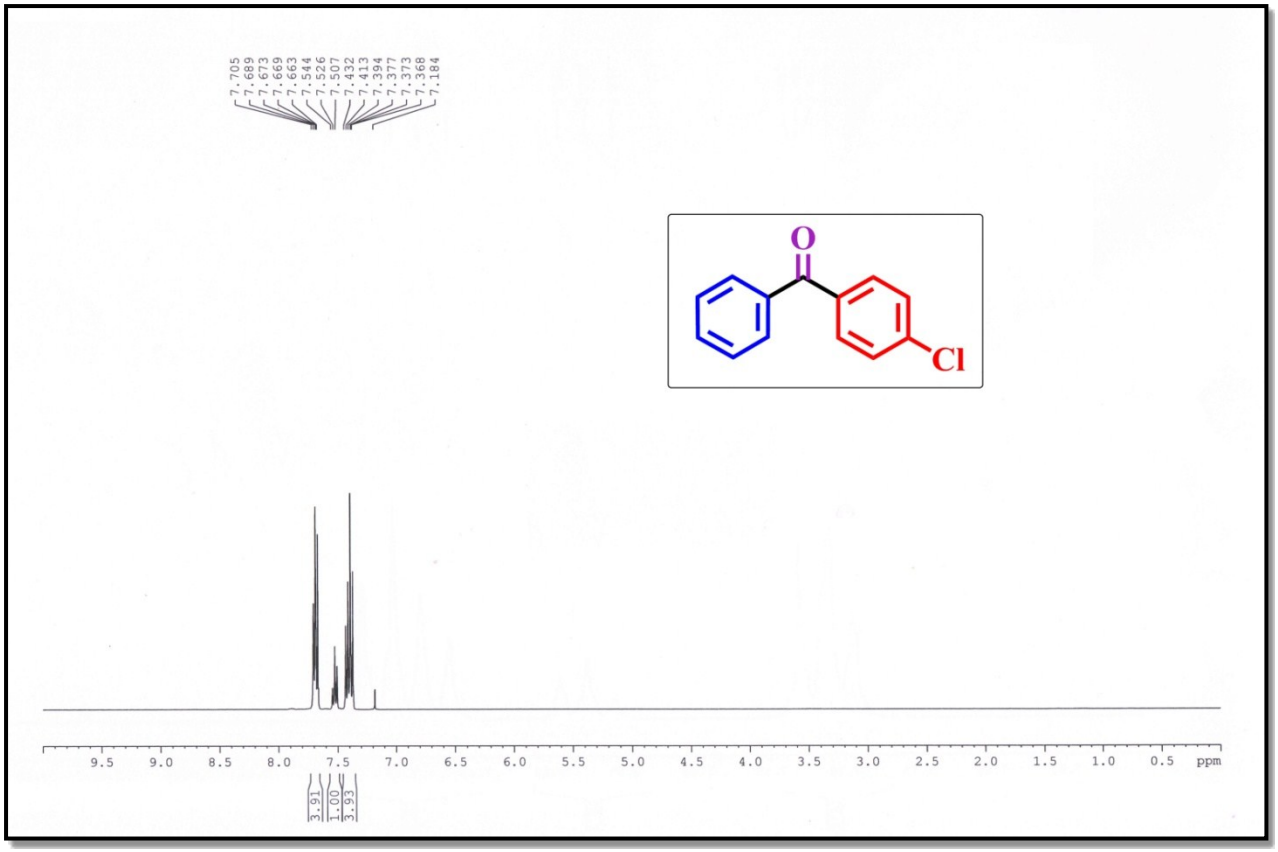

9.849
7.709
7.707
7.700
7.689
7.687
7.677
7.675
7.214
7.138
7.128
7.116
O
S
H
11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.00
2.00
1.02

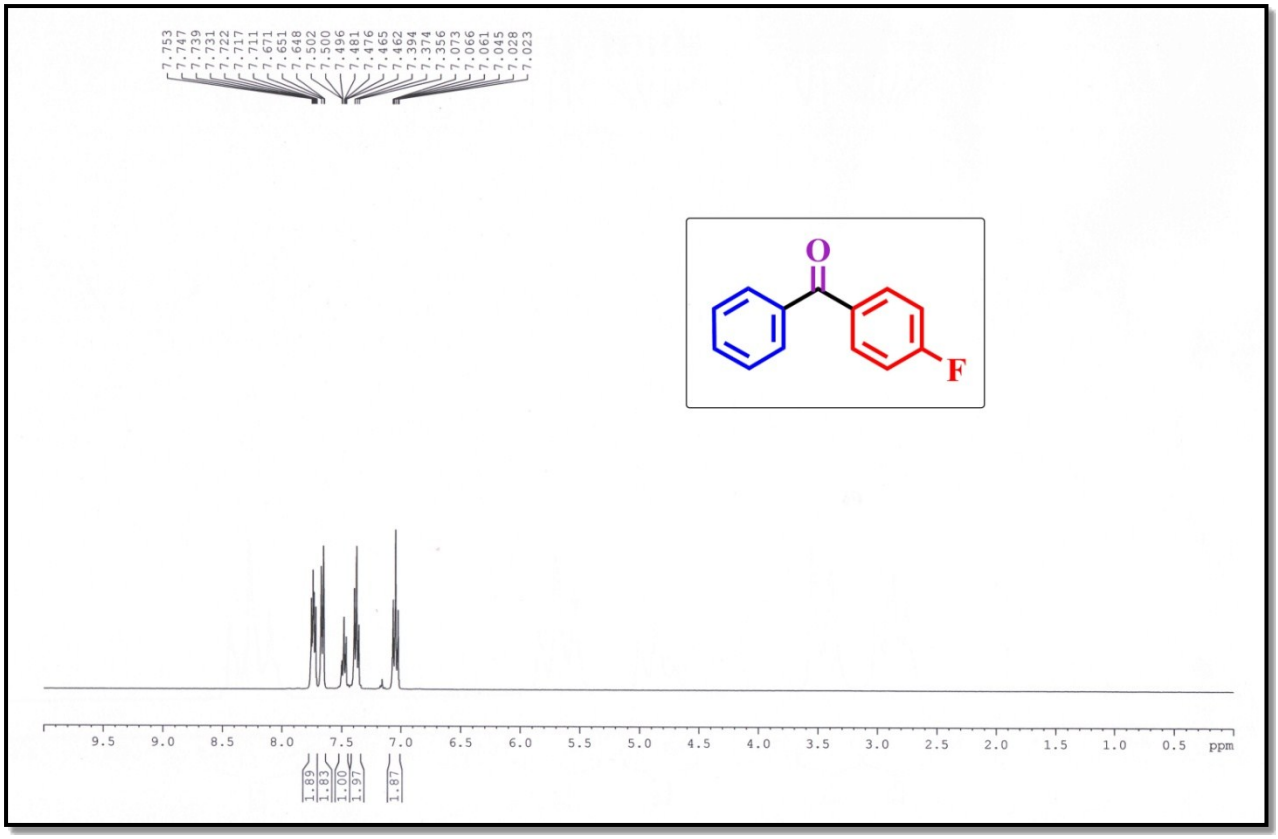
4. *[1]HNMR copies of diaryl ketone*

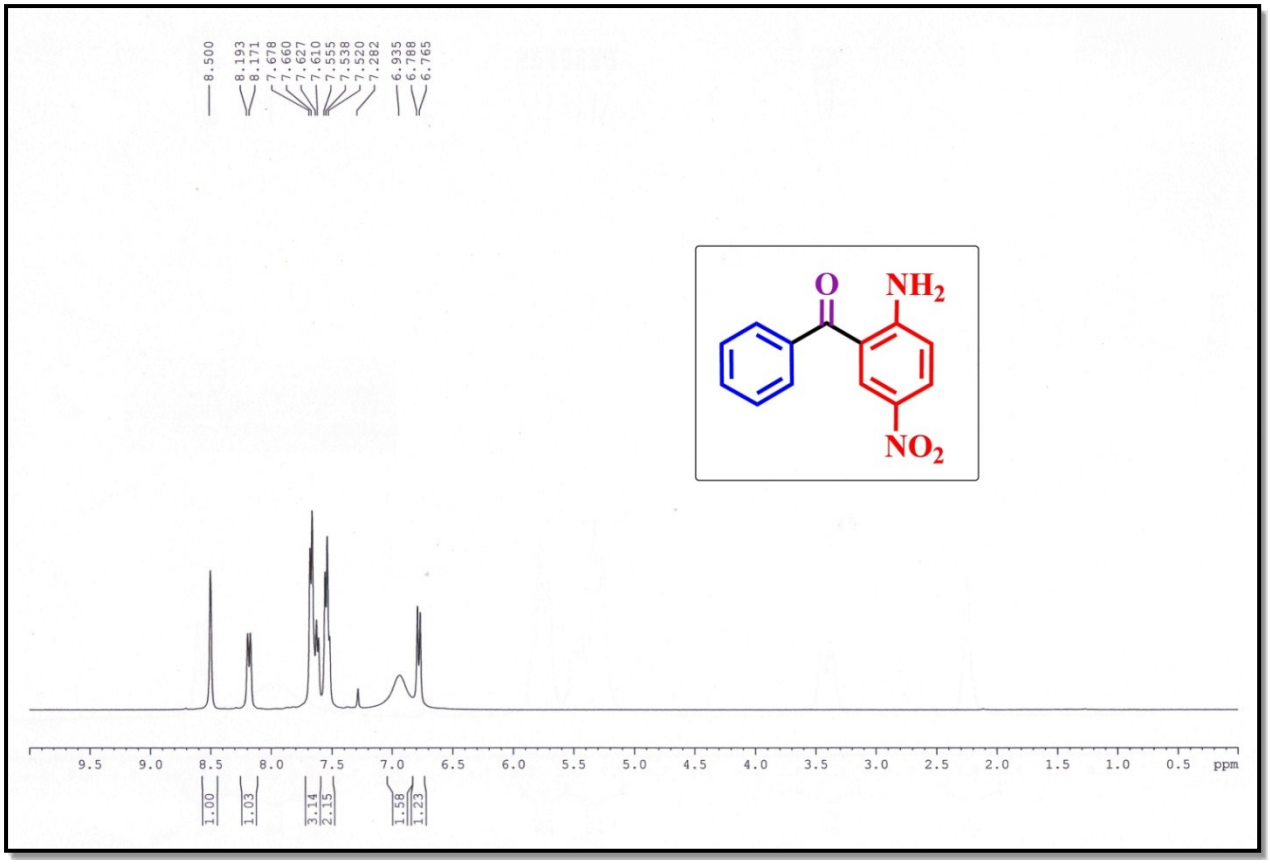


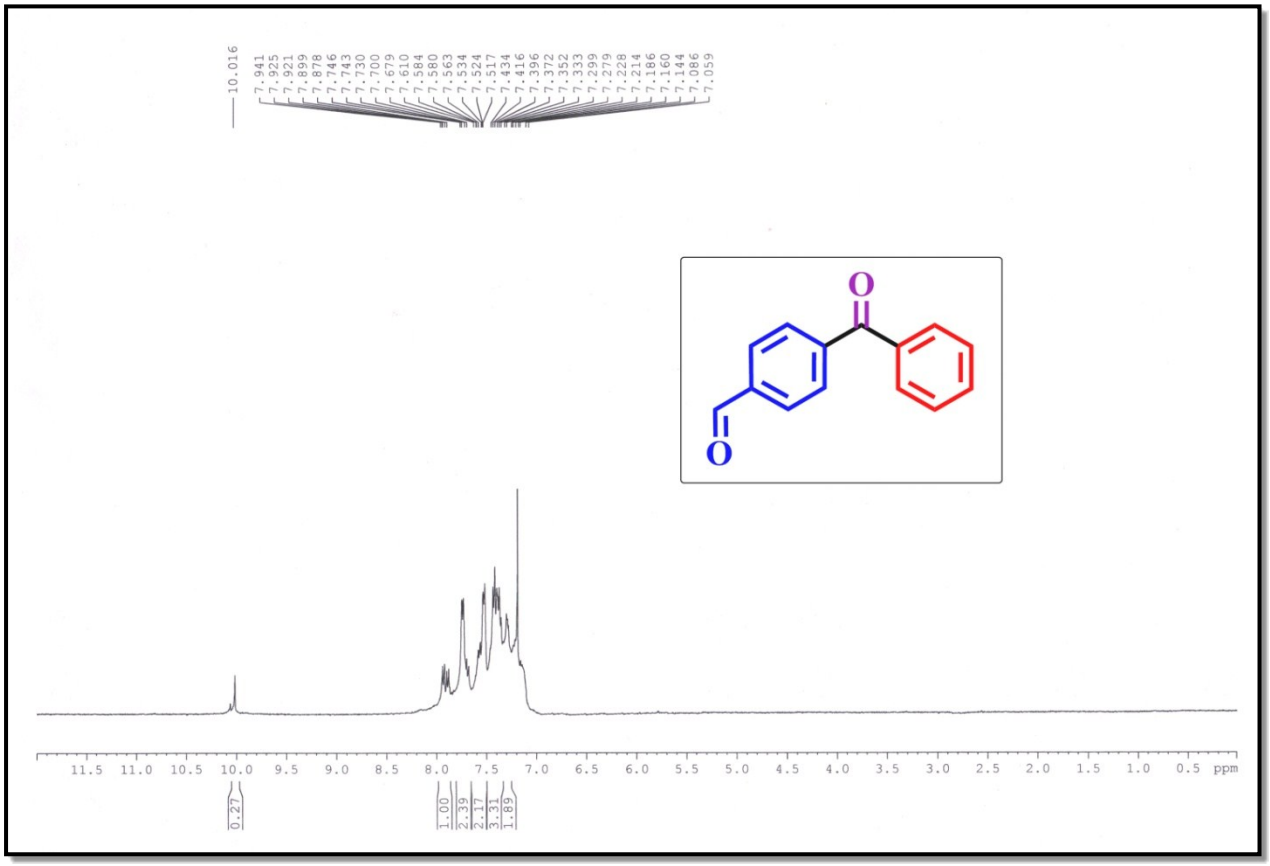

7.749
7.731
7.676
7.658
7.552
7.534
7.516
7.495
7.462
7.444
7.425
7.412
7.400
7.379
7.359
7.341
7.322
7.222
7.184
2.373
O
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
0.43
1.00
2.03
0.50
1.61

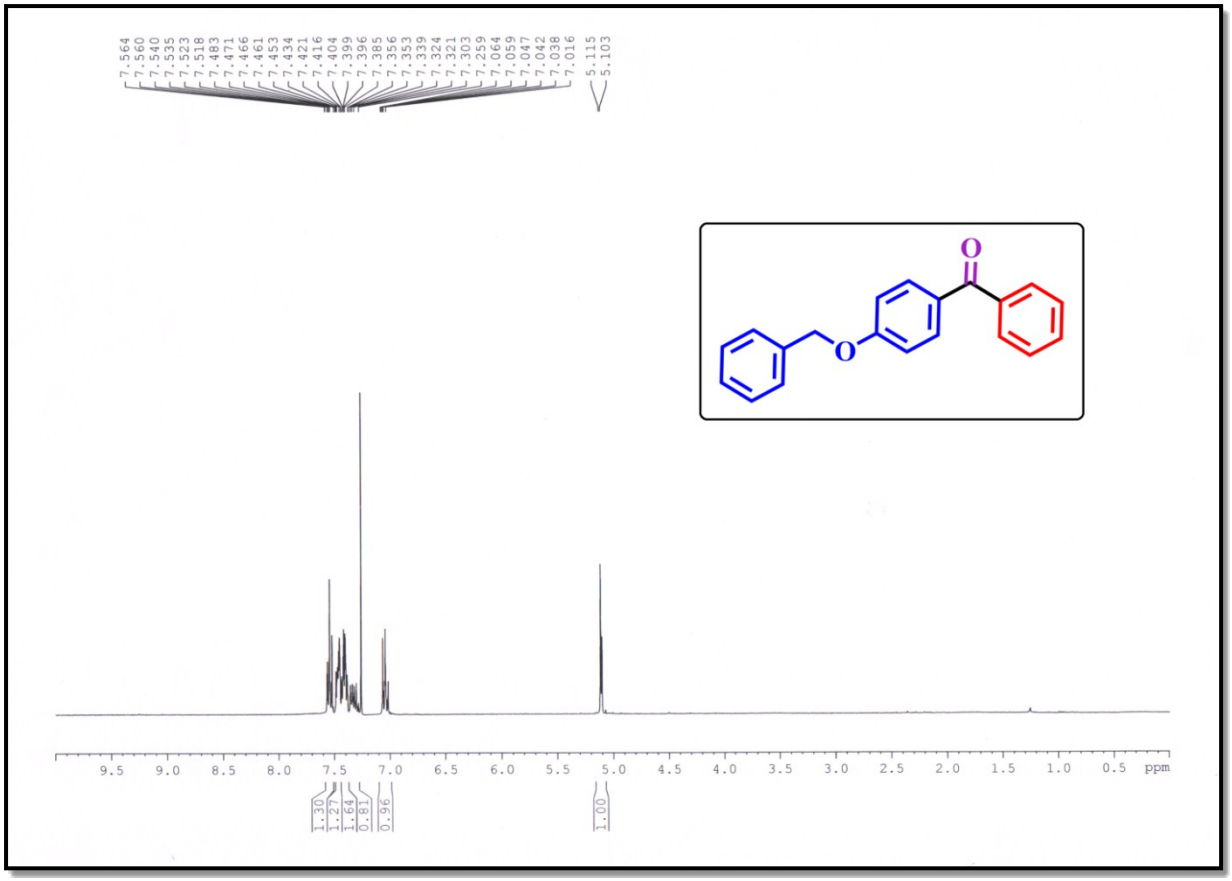

7.676
7.674
7.661
7.656
7.653
7.571
7.567
7.564
7.555
7.549
7.543
7.534
7.531
7.527
7.496
7.487
7.481
7.478
7.467
7.463
7.457
7.335
7.331
7.317
7.314
7.311
7.297
7.293
7.282
6.770
6.749
6.645
6.643
6.627
6.625
6.607
6.136
O
NH2
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.98
1.02
2.96
1.08
1.00
1.01
1.93


7.705
7.689
7.673
7.669
7.663
7.544
7.526
7.507
7.432
7.413
7.394
7.377
7.373
7.368
7.184
O
Cl
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
3.91
1.00
3.93

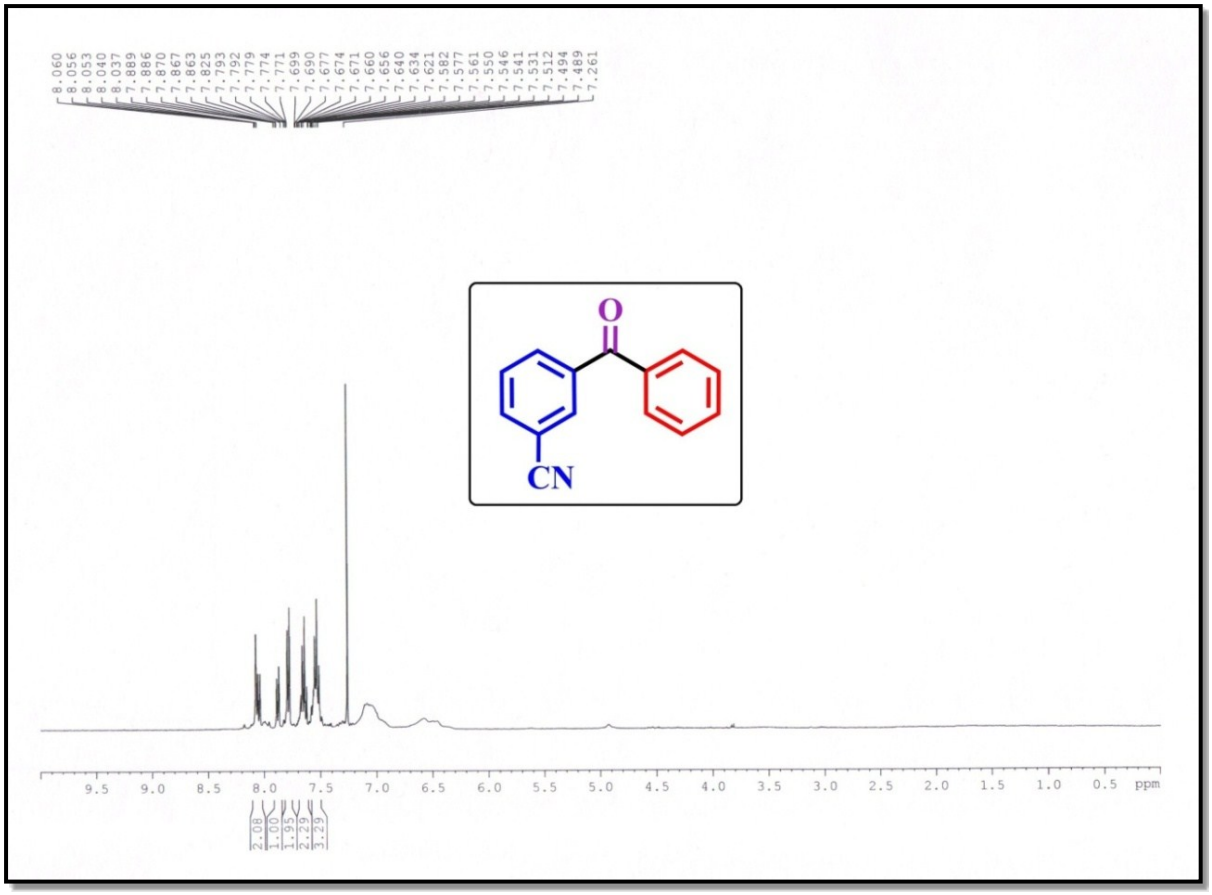

7.753
7.747
7.739
7.731
7.722
7.717
7.711
7.671
7.651
7.648
7.502
7.500
7.496
7.481
7.476
7.465
7.462
7.394
7.374
7.356
7.073
7.066
7.061
7.045
7.028
7.023
O
F
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.89
1.83
1.00
1.97
1.87


8.500
8.193
8.171
7.678
7.660
7.627
7.610
7.555
7.538
7.520
7.282
6.935
6.788
6.765
O
NH2
NO2
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.00
1.03
3.14
2.15
1.58
1.23

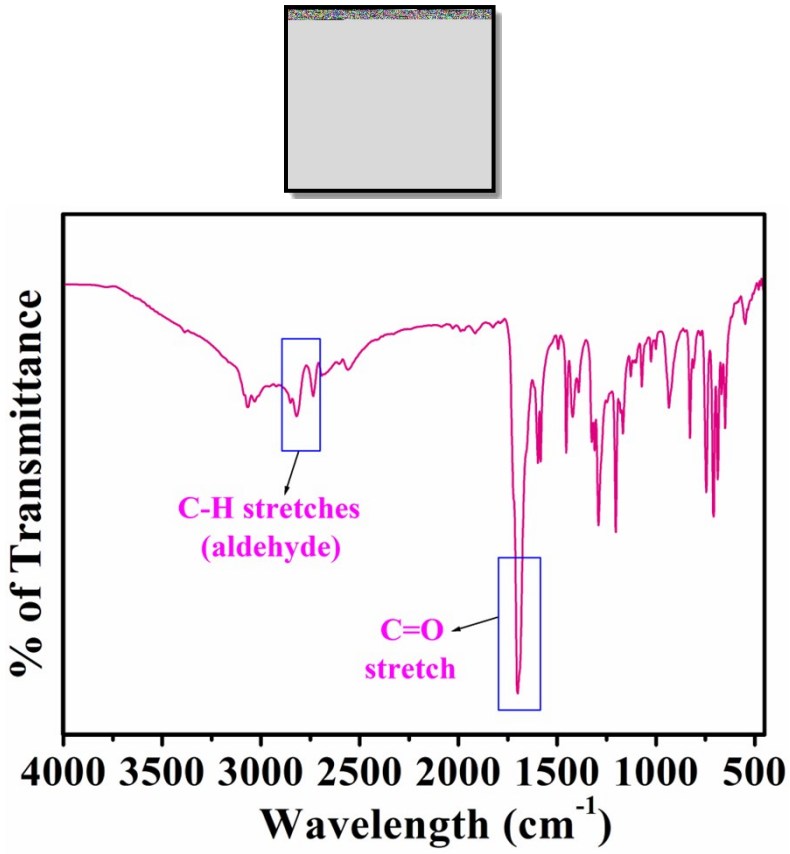

10.016
7.941
7.925
7.921
7.899
7.878
7.746
7.743
7.730
7.700
7.679
7.610
7.584
7.580
7.563
7.534
7.524
7.517
7.434
7.416
7.396
7.372
7.352
7.333
7.299
7.279
7.228
7.214
7.186
7.160
7.144
7.086
7.059
O
O
11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
0.27
1.00
2.39
2.17
3.31
1.89

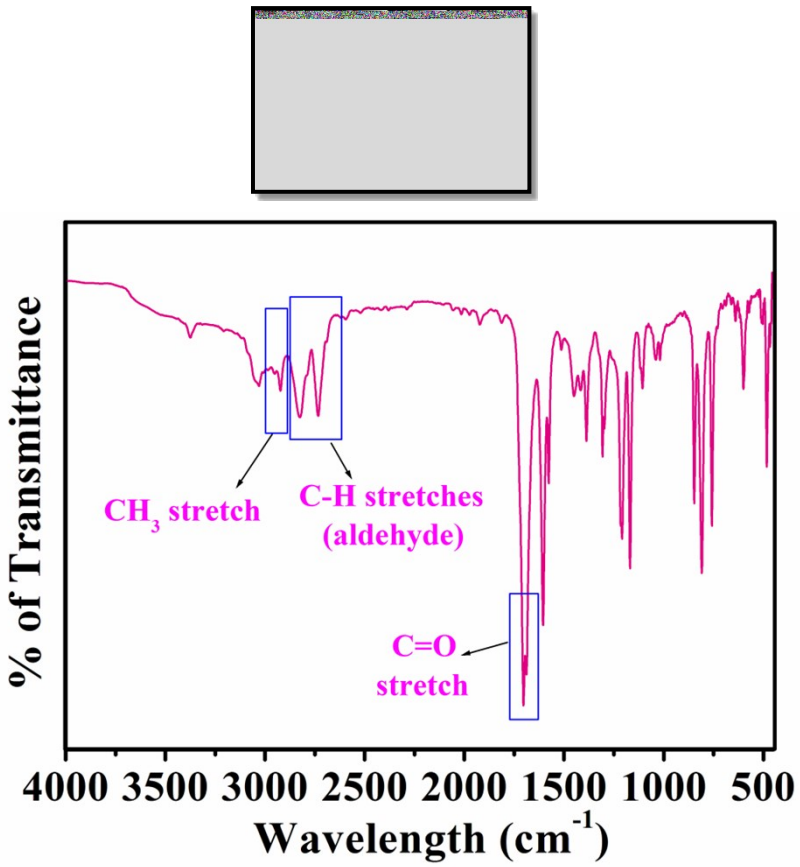

7.564
7.560
7.540
7.535
7.523
7.518
7.483
7.471
7.466
7.461
7.453
7.434
7.421
7.416
7.404
7.399
7.396
7.385
7.356
7.353
7.339
7.324
7.321
7.303
7.259
7.064
7.059
7.047
7.042
7.038
7.016
5.115
5.103
O
O
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.30
1.27
1.64
0.81
0.96
1.00

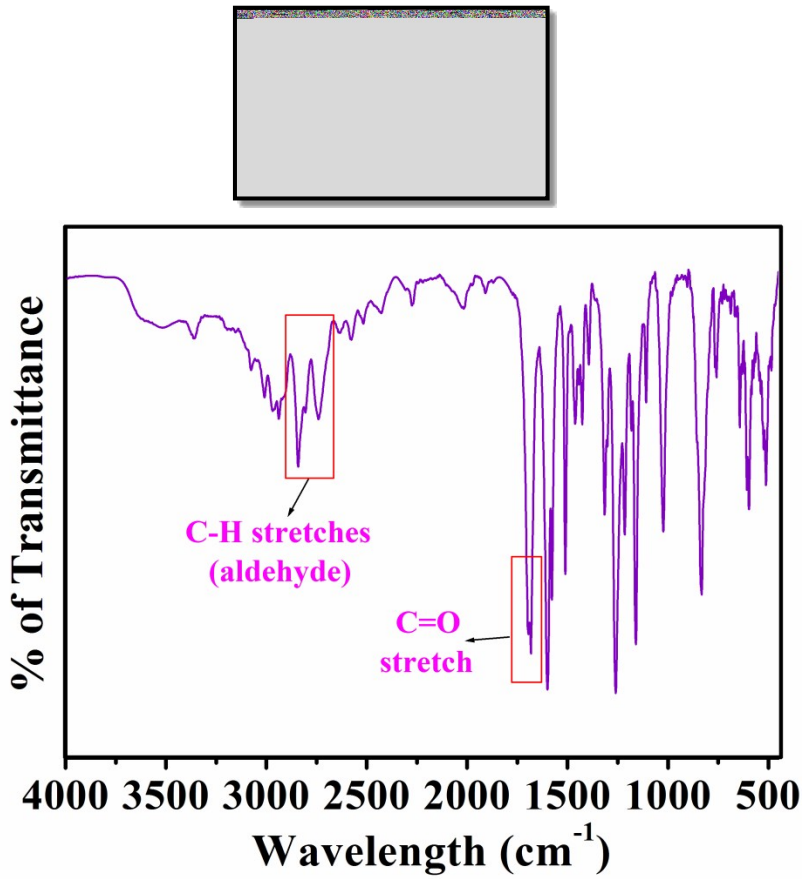

7.749
7.730
7.566
7.548
7.543
7.535
7.432
7.414
7.396
7.258
6.693
6.676
6.670
6.663
3.775
O
O
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.54
2.58
1.80
1.89
3.00

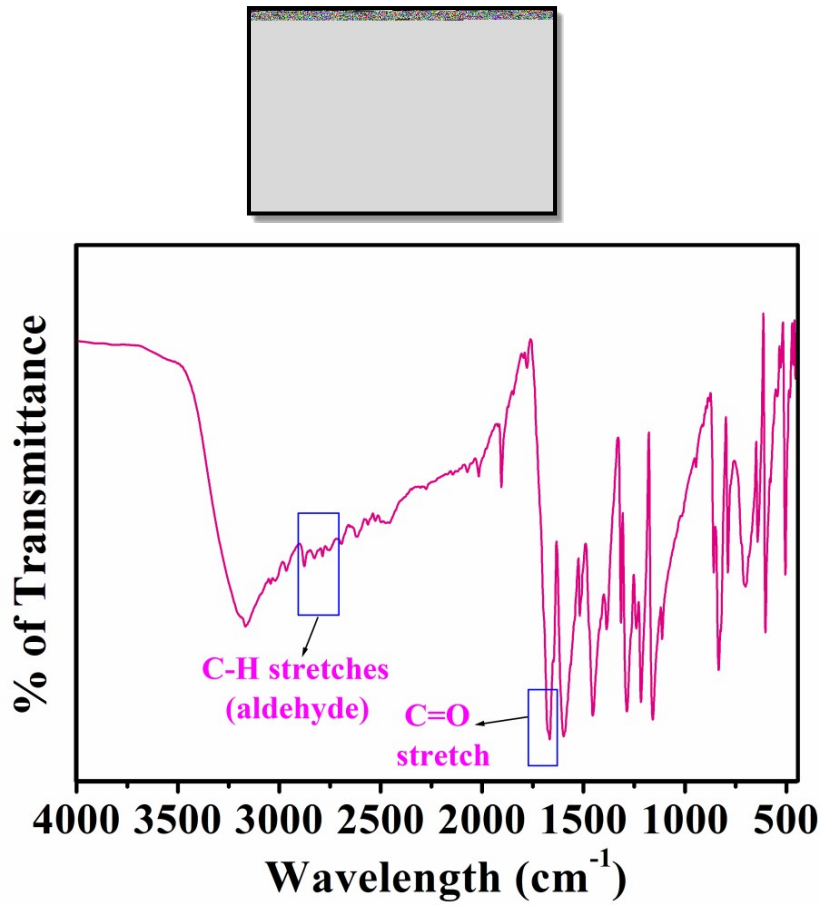


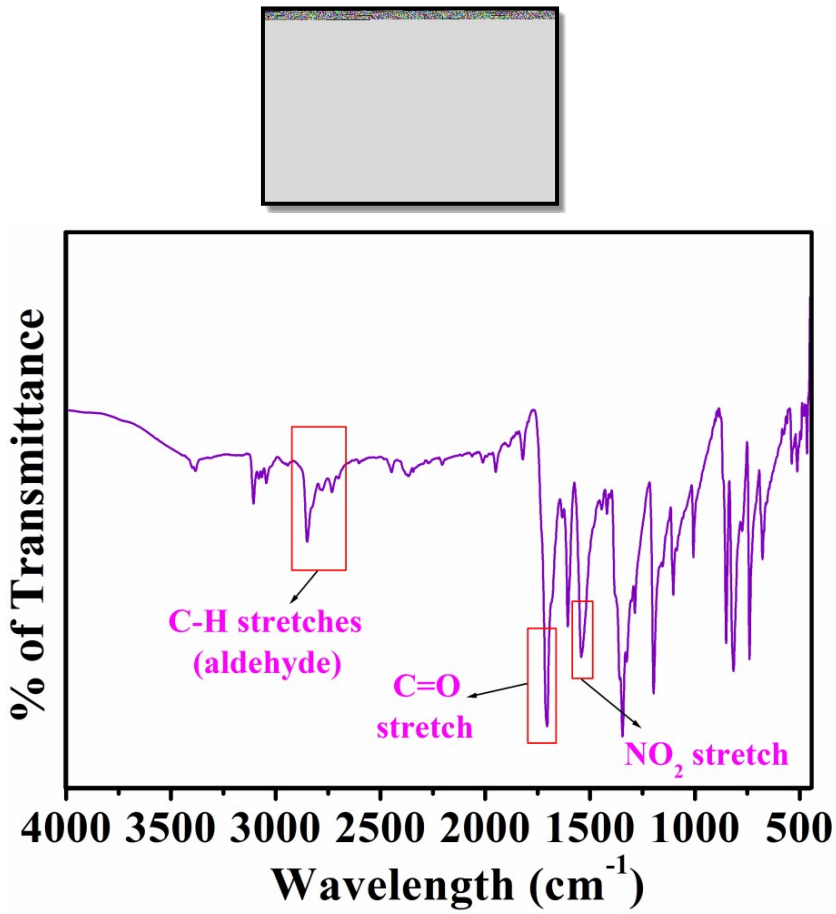
5. *FTIR spectra of insitu carbonylative products*

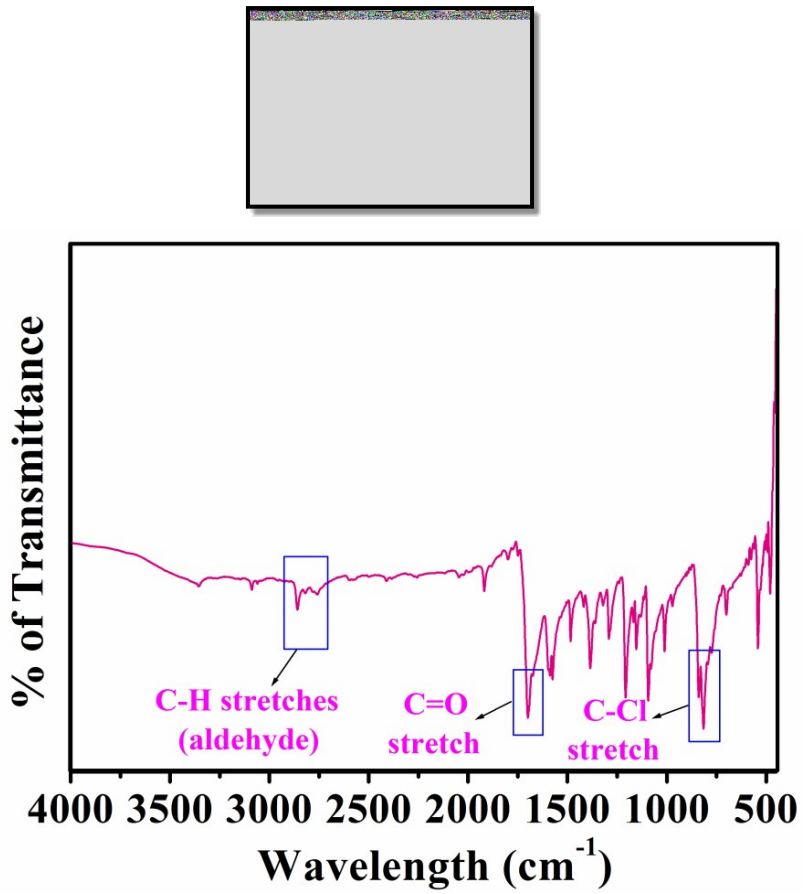


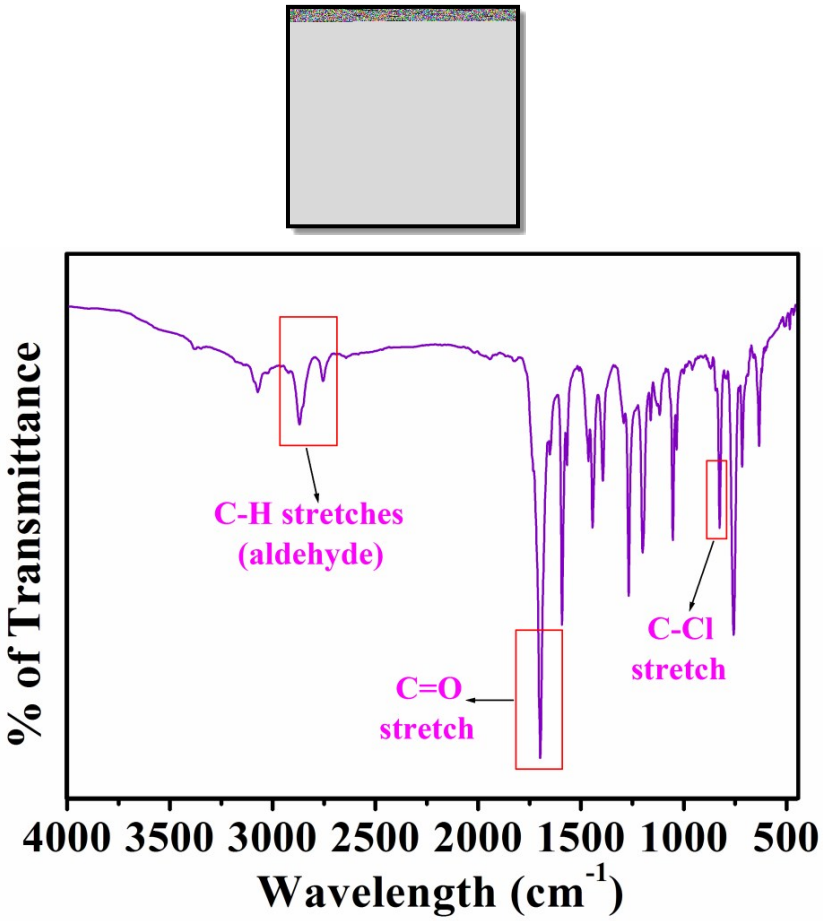

% of Transmittance
CH3 stretch
C-H stretches
(aldehyde)
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

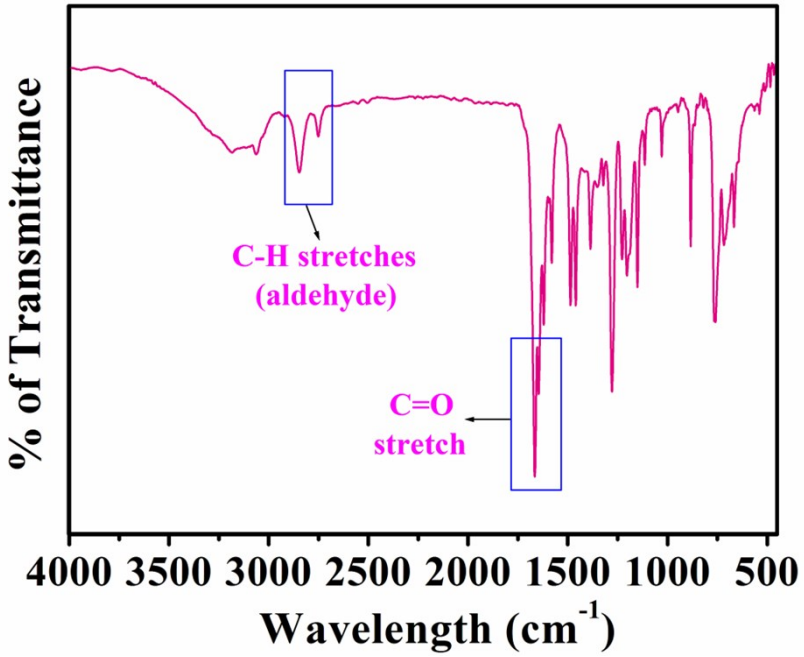

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

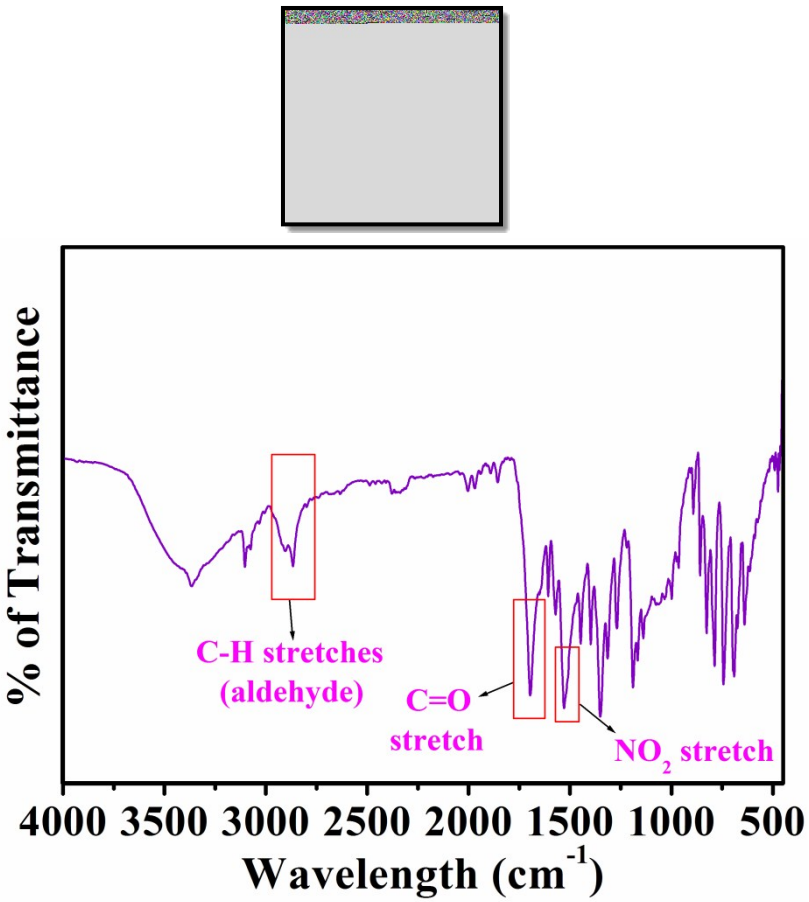

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

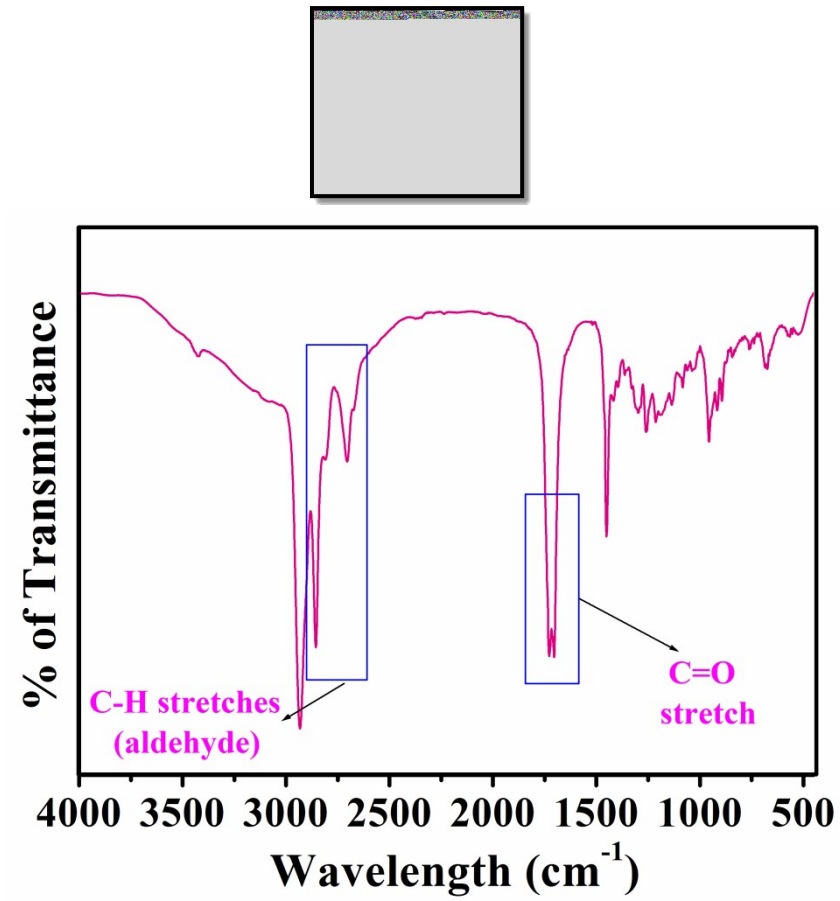

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
NO2 stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

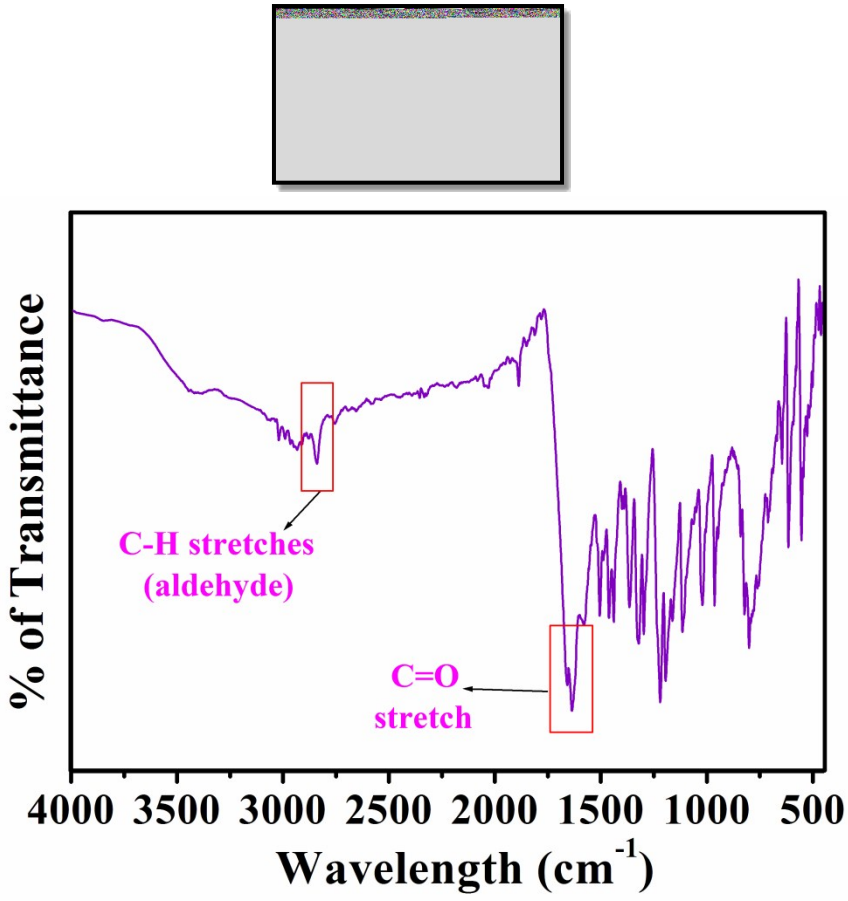

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
C-Cl
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

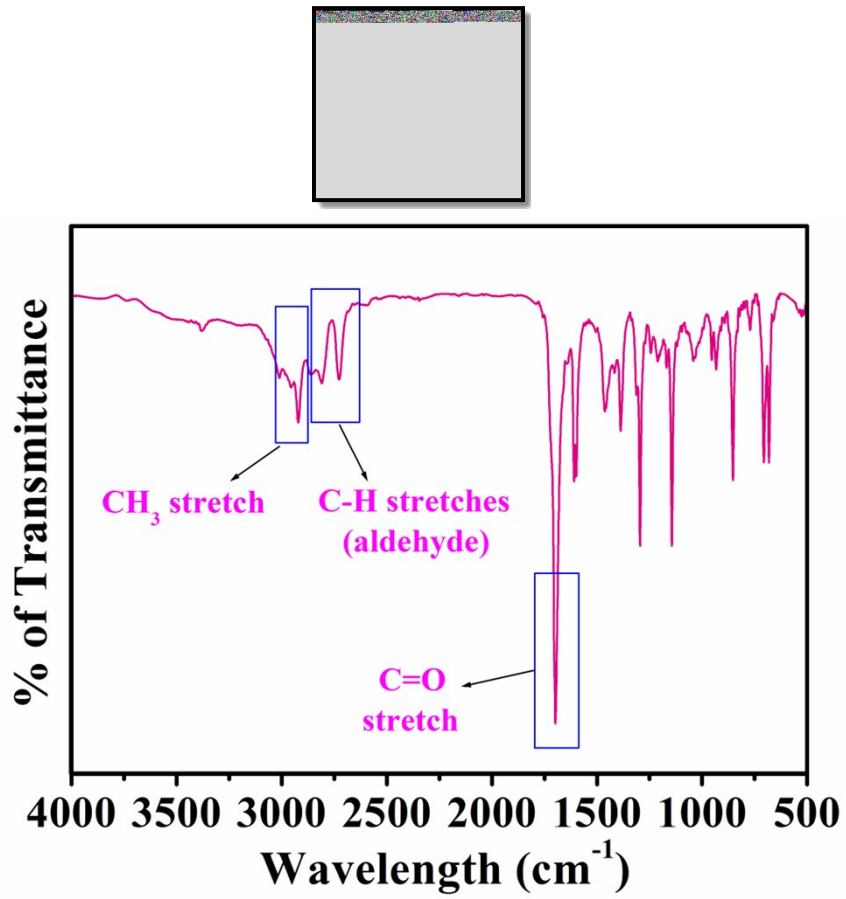

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
C-Cl
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

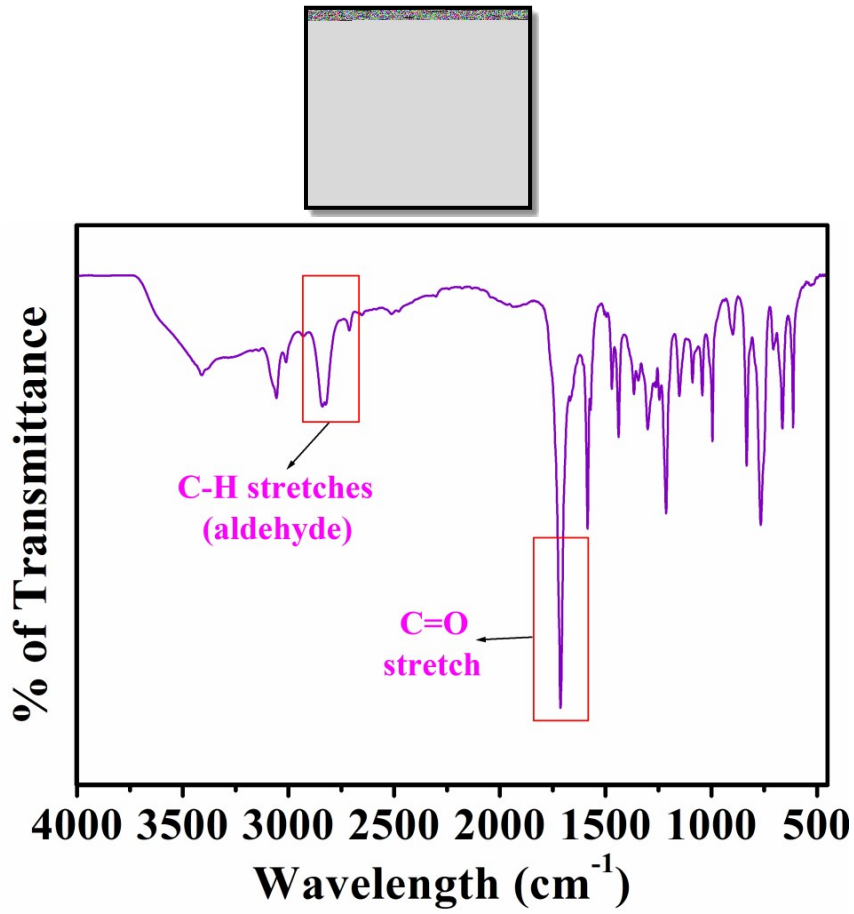

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

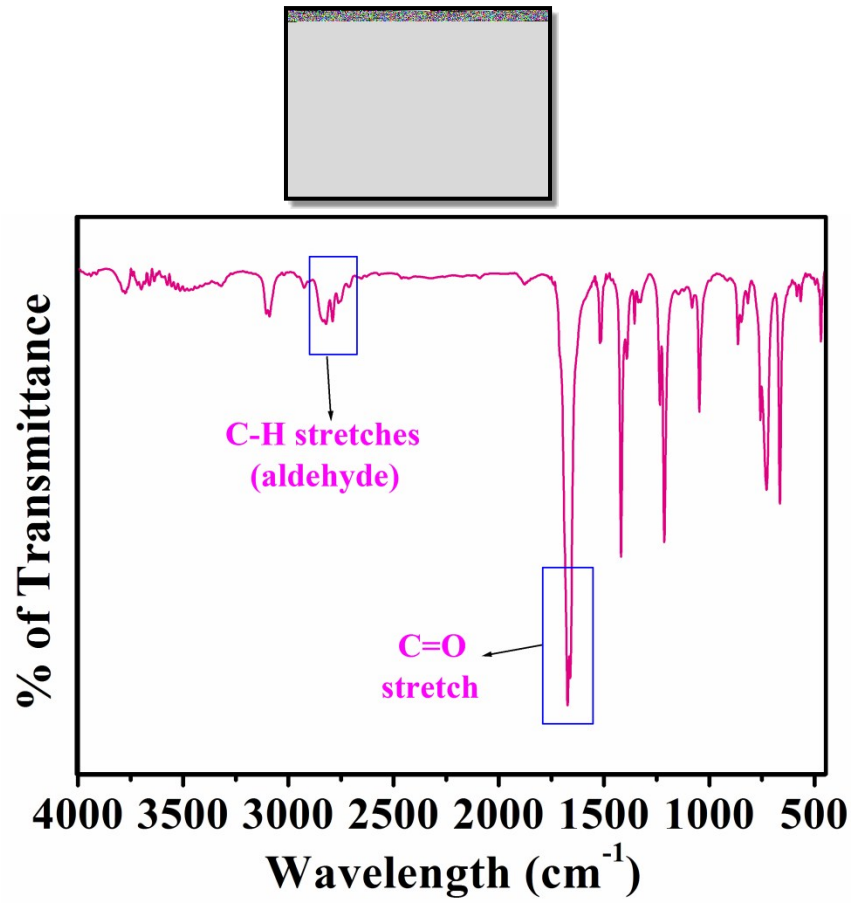

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
NO2 stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)


% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

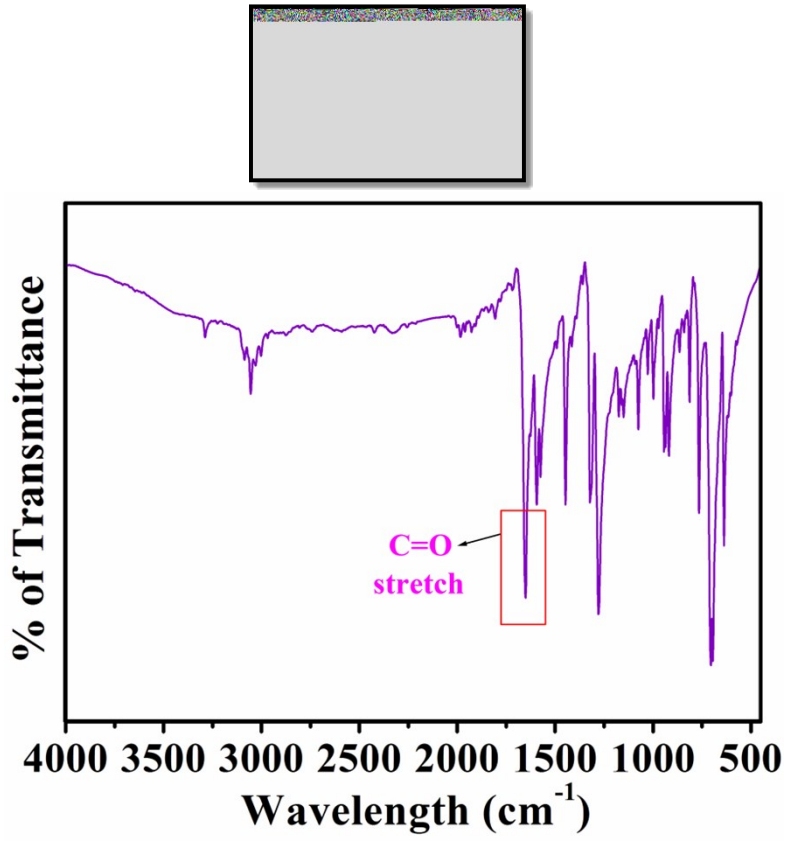

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

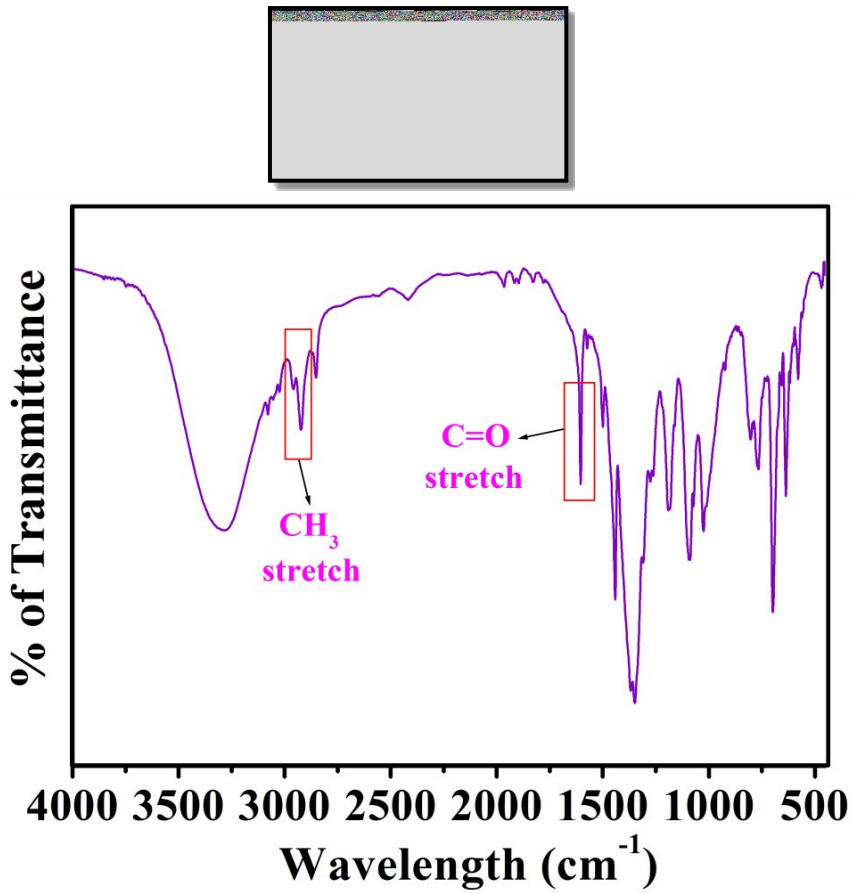

% of Transmittance
CH3 stretch
C-H stretches
(aldehyde)
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

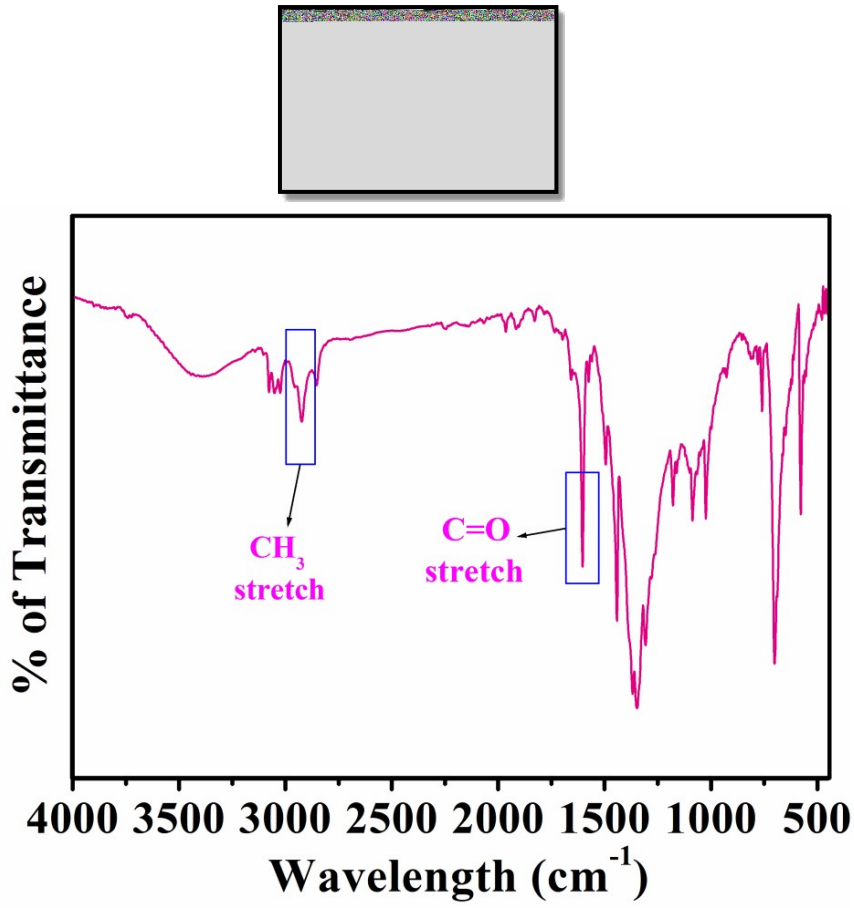

% of Transmittance
C-H stretches
(aldehyde)
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

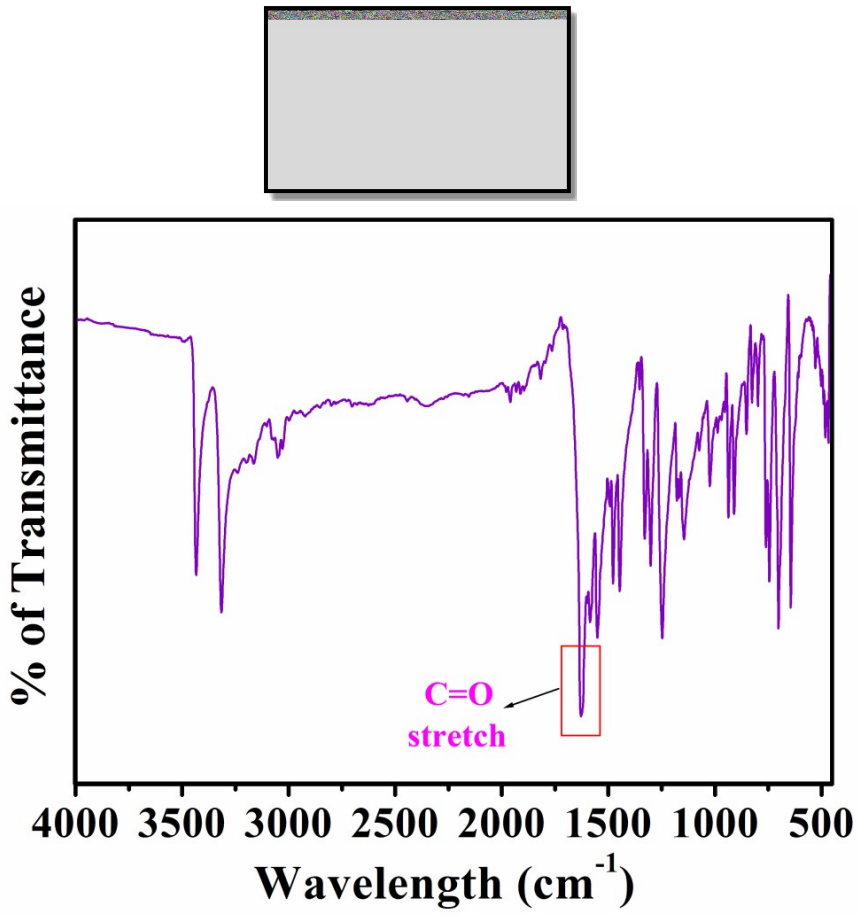


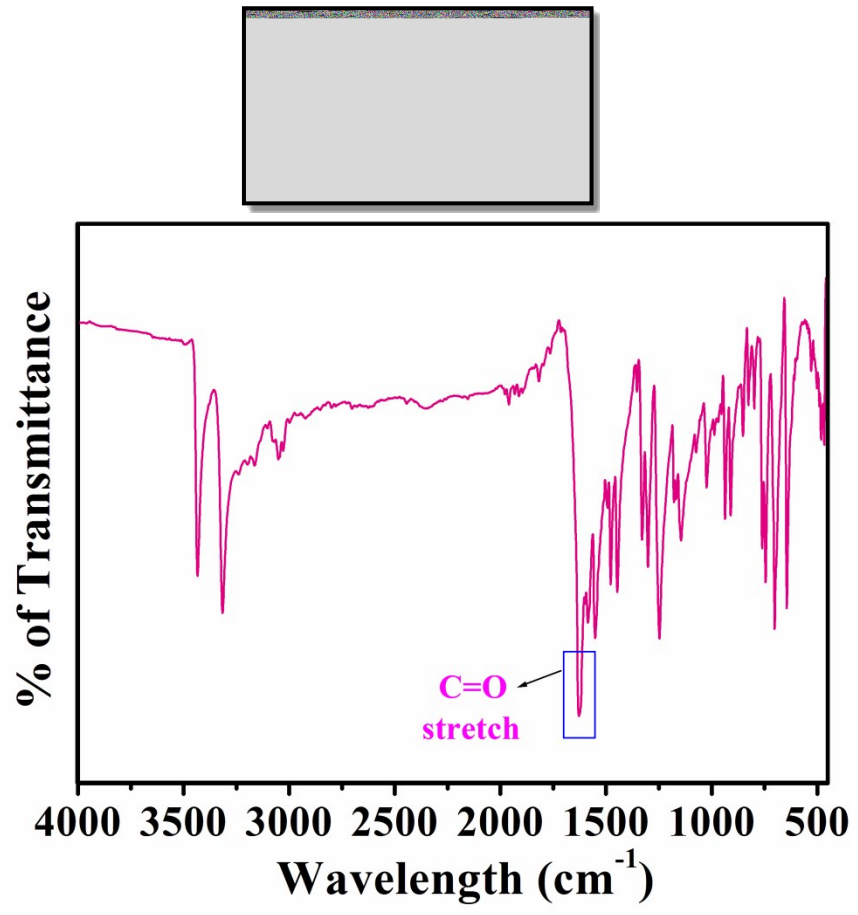
6. ***FTIR spectra of diaryl ketone***

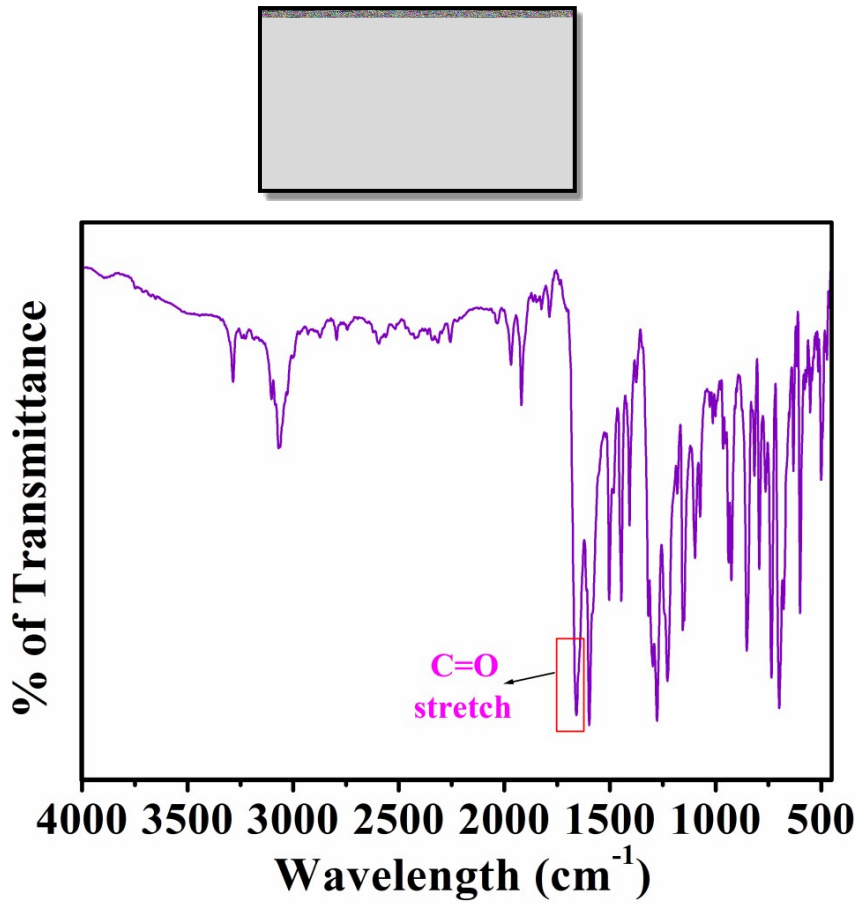


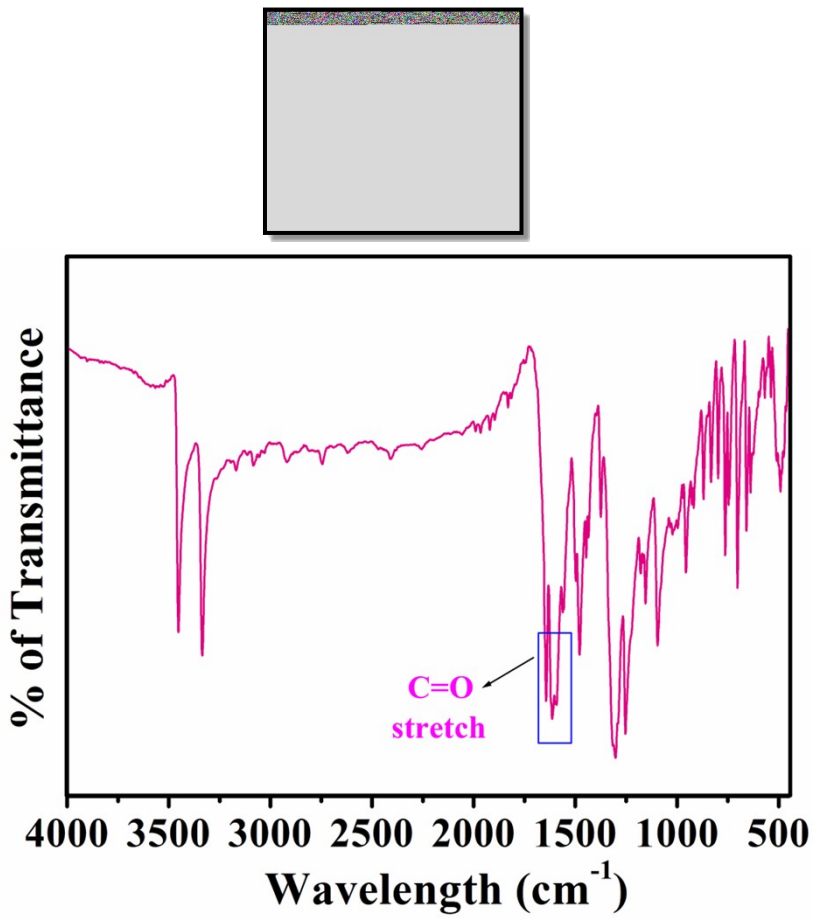

% of Transmittance
C=O
stretch
CH3
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

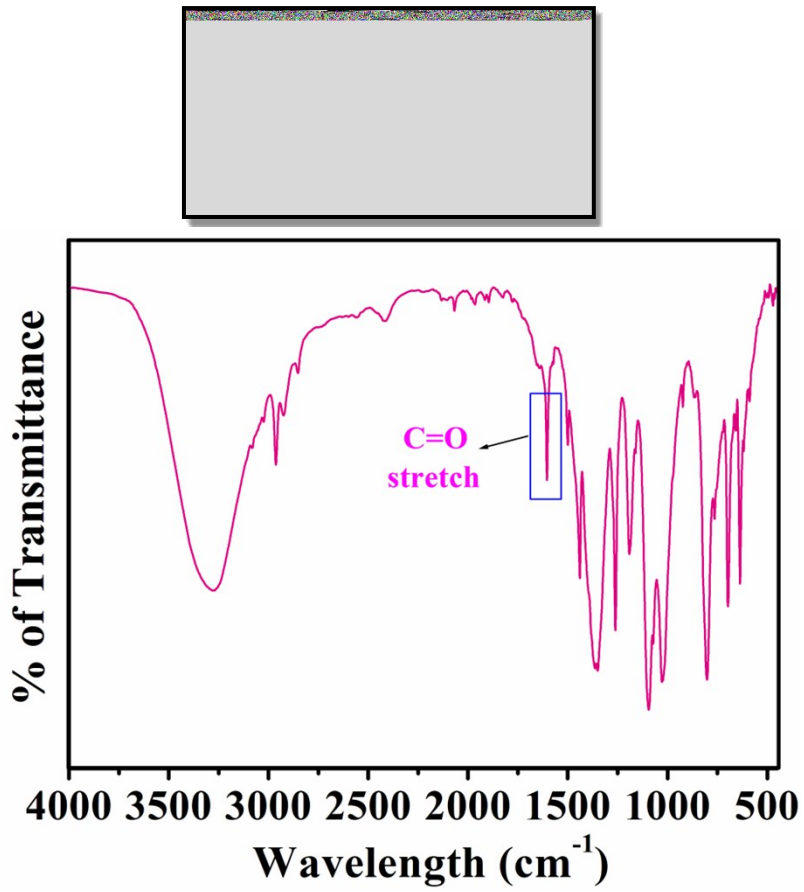

% of Transmittance
CH3
stretch
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

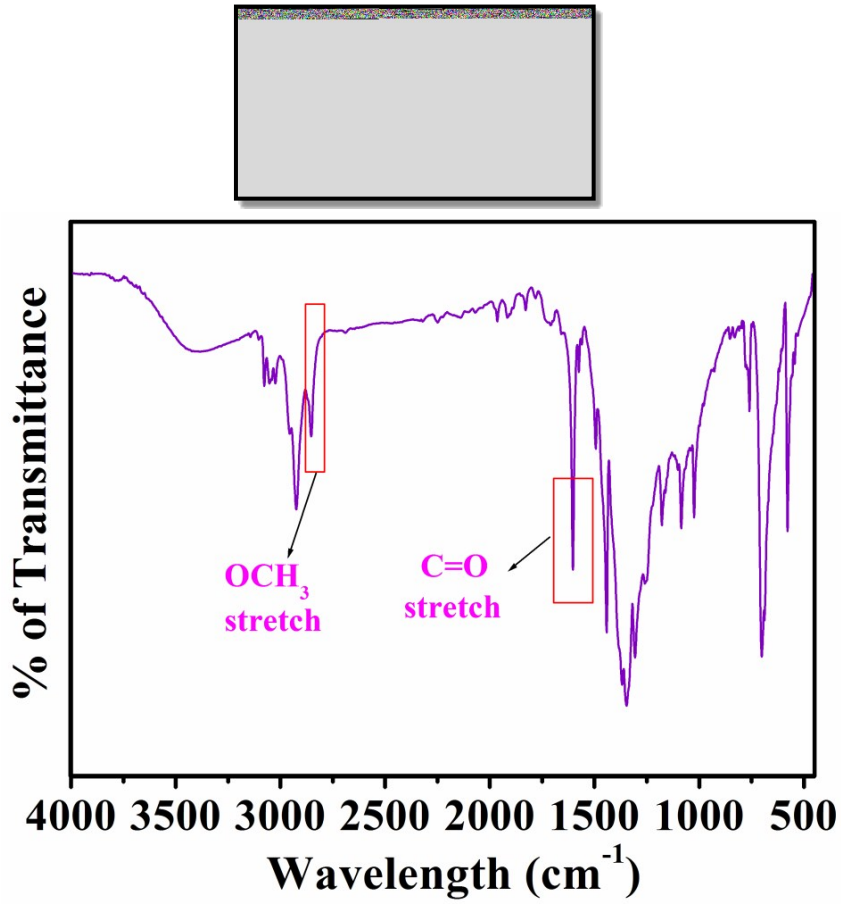

% of Transmittance
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)

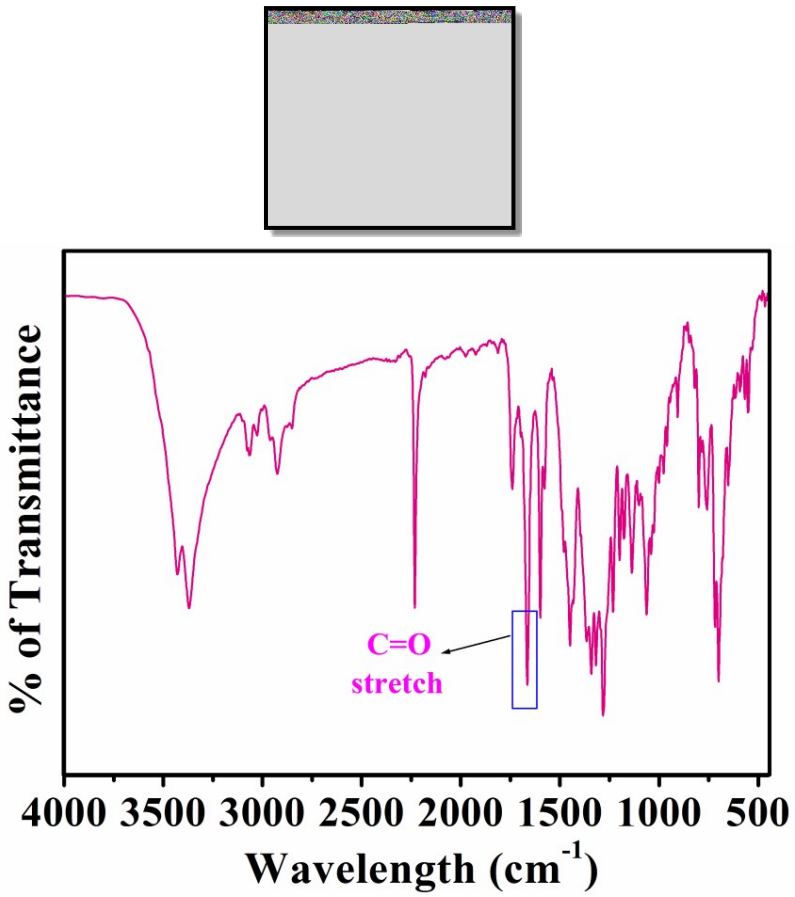

% of Transmittance
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)


% of Transmittance
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)


% of Transmittance
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)


% of Transmittance
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)


% of Transmittance
OCH3
stretch
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)


% of Transmittance
C=O
stretch
4000 3500 3000 2500 2000 1500 1000 500
Wavelength (cm-1)