# Synthesis, Characterization and Antimicrobial Activity of various Chalcone Derivatives

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Abstract: Chalcone are precursor of the natural occurring flavonoids family. Chalcone consists of two aromatic rings linked by three carbon carbonyl system. The chemistry and biological activities of Chalcone has motivate to synthesis Chalcone as a potential compound for antimicrobial activity. In the present work, a series of Chalcone derivatives were synthesized by Claisen-Schmidt Condensation reaction in which various substituted benzaldehyde and acetoaryl were condensed in the presence of aqueous alcoholic alkali solution. The structures of these compounds were confirmed on the basis of the spectral data. The compounds were screened for their antibacterial activity against B.subtilius, S.aureus, E.coli, P.aureoginosa and antifungal activity against A.niger. The results indicate that synthesized compounds have appreciable antibacterial and antifungal activity.

Keywords: Chalcone, acetoaryl, antimicrobial activity, parallel synthesizer, MIC.

#### 1. Introduction

The need of new antimicrobial agents has increased as misuse and overuse of antibiotic has created multidrug resistance, this has resulted in global health crisis. So, it has become inevitable for development of new and effective broad spectrum antimicrobial agent and with which there is no cross resistance with the available drugs. The pharmacological activities and chemistry of Chalcone has developed interest to synthesis various Chalcone derivatives for their antimicrobial activity.

Chalcone with antibacterial properties have been known since the 1940s(Deepa Gupta*et al*,2010).Chalcone is an open chain flavonoid in which two aromatic rings are linked three carbon  $\alpha$   $\beta$  unsaturated carbonyl system which is responsible for their biological activities(Ramesh *et al*,2012).Chalcone are well known intermediates for synthesizing various heterocyclic compounds like benzothiazepine(O Prakash*et al*,2005),pyrazolines(RY Prasad*et al*,2005), 1,4 diketones

(S Raghavan and K Anuradha,2002)and flavones(BA Bohn,1998).Chalcones and its derivatives have shown a wide variety of therapeutic activities likeantifungal(Bekhit A. A and Habib N. S,2001),anti-oncogenic(Lopez S. N,2001),anti-inflammatory(Kumar S.Ket al,2003) ,anti-ulcerative(Hsieh H. Ket al ,1998),analgesic(Murakami Set al,1991),antiviral(Viana G. S.;Bandeira M. A.; Matos F. J,2003) anti-bacterial(WuJ. H.; Wang X. H.; Yi Y. H.; Lee K. H,2003), antimalarial(Liu M.; Go P.; Wilairat M. L,2001), antiprotozoal (LunardiFet al,2003), antifilarial (AwasthiSKet al,2009), larvicidal (Begum NA; Roy N;

Laskar RA; Roy K,2010),anti-convulsant(Kaushik S; Kumar N; Drabu S,,2010),anti-oxidant(Vogel S; Ohmayer S; Brunner G; Heilmann J, ,2008).They have also shown inhibition of the enzymes,like mammalian  $\alpha$ -amylase(Najafian Met al,2010), cyclooxygenase (Zarghi Aet al,2006) and monoamine oxidase (Chimenti Fet al, 2009).

There are various methods to synthesis Chalcone and its derivatives. The most convenient and simplest method is Claisen –Schmidt Condensation Reaction. In the present work, we report reaction between various acetoaryl and substituted benzaldehyde in the presence of aqueous alcoholicalkali solution to form Chalcone derivatives.

# 2. Experimental

The melting point was determined by Lab India Visual Melting point Apparatus and uncorrected. The IR spectra of the synthesized compounds were recorded on Bruker ATR spectrophotometer. The <sup>1</sup>H NMR were recorded in CDCl<sub>3</sub>using Bruker NMR spectrometer and chemical shifts reported are as parts per million(ppm) using tetramethylsilane (TMS) as internal standard. All the compounds were synthesized by Rodleys Tech Parallel Synthesizer. Reactions were monitored using thin layer chromatography (TLC). The visualization was done using iodine vapour.

#### 3. Scheme of Synthesis

3.1 Scheme 1



## 3.1.1 List of substituted benzaldehdye

- 1. benzaldehyde
- 2. 2-nitrobenzaldehdye
- $3. \ p\ chloroben zaldeh dye$
- 4. 3-nitrobenzaldehdye
- $5. \ p\text{-methoxybenzaldehyde}$
- 6. 2,4-dichlorobenzaldehdye
- 7. p-dimethylaminobenzaldehdye
- 8. cinnamaldehdye

#### 3.1.2 Synthetic procedure



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substituted benzaldehdye

### 3.2.1 List of Substituted Benzaldehdye

- 1. benzaldehdye
- 2. 2-nitrobenzaldehdye
- 3. p-chlorobenzaldehdye
- 4. 3-nitrobenzaldehdye
- 5. p-methoxybenzaldehyde
- 6. 2,4-dichlorobenzaldehdye
- 7. p-dimethylbenzaldehdye
- 8. cinnamaldehdye

#### 3.3 Scheme 3





2-acetylnaphthalene

substituted benzaldehyde

### 3.3.1 List of substituted benzaldehdye

- 1.benzaldehdye
- 2. 2-nitrobenzaldehdye
- 3. p-chlorobenzaldehdye
- 4. 3-nitrobenzaldehdye
- 5. p-methoxybenzaldehyde
- 6. 2,4-dichlorobenzaldehdye
- 7. p-dimethylbenzaldehdye
- 8. Cinnamaldehdye

#### 3.3.2 Synthetic procedure:-

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To a solution of 2-acetylnaphthalene(0.02mol) taken in a 250ml round bottom flask ,added cooled mixture of 10% potassium hydroxide and ethanol , stirred thoroughly, then solution of substituted benzaldehyde (0.02mol)was added .The reaction mixture was kept for reflux for 2hour on parallel synthesizer at 120°C,95rpm.The solvent was drained and lump obtained was washed with cold water till it become neutral and recrystallized from ethanol. The recrystallized product was kept in cold water for overnight.

To a solution of acetophenone(0.02mol) taken in a 250ml round bottom flask,added cooled mixture of 10% potassium hydroxide and ethanol, stirred thoroughly, then solution of substituted benzaldehyde (0.02mol)was added The reaction mixture was kept for reflux for 3hour on parallel synthesizer at 110°C,75rpm.The solvent was drained and lump obtained was washed with cold water till it become neutral and recrystallized from ethanol. The recrystallized product was kept in cold water for overnight.

#### 3.2 Scheme 2



chalcone derivatives(II)

### **3.2.2 Synthetic Procedure**

To a solution of 1-acetylnaphthalene(0.02mol) taken in a 250ml round bottom flask ,added cooled mixture of 10% potassium hydroxide and ethanol , stirred thoroughly, then solution of substituted benzaldehyde (0.02mol)was added .The reaction mixture was kept for reflux for 2hour on parallel synthesizer at 115°C,85rpm.The solvent was drained and lump obtained was washed with cold water till it become neutral and recrystallized from ethanol. The recrystallized product was kept in cold water for overnight.



#### Table 1: Physical Data of synthesized compounds

Compound	Molecular	Molecular	M.P(°C)	Yield
_	Formula	Weight		(%)
A1(1,3-diphenylprop-2-	$C_{15}H_{12}O$	208	55-59	68.05
en-1-one)				
A2(3-(4-chlorophenyl)-1-	$C_{15}H_{11}ClO$	242.5	116-118	85.41
phenylprop-2-en-1-one)				
A3(3-(4-methoxyphenyl)-	$C_{16}H_{14}O_2$	238	62-65	72.18
1-phenylprop-2-en-1-one)				
<b>A4</b> (3-[4-	C <sub>17</sub> H <sub>17</sub> NO	251	82-86	54.68
(dimethylamino)phenyl]-				
1-phenylprop-2-en-1-one)				
A5(3-(2-nitrophenyl)-1-	$C_{15}H_{11}NO_3$	253	93-96	71.75
phenylprop-2-en-1-one)				
A6(3-(3-nitrophenyl)-1-	C <sub>15</sub> H <sub>11</sub> NO <sub>3</sub>	253	70-73	80.10
phenylprop-2-en-1-one)				
A7(3-(2,4-	$C_{15}H_{10}Cl_2O$	277	105-108	92.64
dichlorophenyl)-1-				
phenylprop-2-en-1-one)				
A8(1,5-diphenylpenta-2,4-	$C_{17}H_{14}O$	234	96-100	79.87
dien-1-one)				

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A9(1-(napht)	halen-	1-yl)-3-	$C_{19}H_{14}O$	258	101-105	93.73				2.73(s,6H,CH3)
phenylprop-	2-en-1-	-one)					A5	0.80	2920 cm <sup>-1</sup> (Ar C-H str),1673	8.15-8.23 (d,2H, CO-
A10(3-(4-ch	loroph	enyl)-	C <sub>19</sub> H <sub>13</sub> ClO	292	94-97	75.32			cm <sup>-1</sup> (C=O str), 1463 cm <sup>-1</sup>	CH=CH-), 7.35-8.87
1-(naphthale	en-1-yl	)prop-							(Ar-C=C str),	(m, 9H, Ar-H)
2-en-1-one)									$1362 \text{ cm}^{-1}(\text{NO}_2 \text{str})$	
A11(3-(4-			$C_{20}H_6O$	288	77-81	74.43	A6	0.68	3059 cm <sup>-1</sup> (Ar C-H str),1666	8.01-8.08 (d,2H,CO-
methoxyphe	nyl)-1-								cm <sup>-1</sup> (C=O str), 1468 cm <sup>-1</sup>	CH=CH-), 7.30-7.99
(naphthalen-	-1-yl)pi	rop-2-							(Ar-C=C str),	(m, 9H, Ar-H)
en-1-one)									$1349 \text{ cm}^{-1}(\text{NO2 str})$	
A12(3-[4-			C <sub>21</sub> H <sub>9</sub> NO	301	87-90	79.43	A7	0.87	1679 cm <sup>-1</sup> (C=O str), 1471	7.90-7.94(d,2H,CO-
(dimethylam	nino)ph	enyl]-							cm <sup>-1</sup> (Ar-C=C str),692 cm <sup>-1</sup>	CH=CH-), 7.32-7.95
1-(naphthale	en-1-yl)	)prop-							<sup>1</sup> (C-Clstr)	(m, 6H, Ar-H)
2-en-1-one)							A8	0.67	3028cm <sup>-1</sup> (Ar C-H str),1657	7.83-7.86 (d,4H,CO-
A13(1-(napl	hthalen	-1-yl)-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub>	303	125-129	74.67			cm <sup>-1</sup> (C=O str), 1493 cm <sup>-1</sup>	CH=CH-), 7.22-7.89
3-(2-nitroph	enyl)pi	rop-2-							(Ar-C=C str)	(m, 10H, Ar-H)
en-1-one)	2 / 1						A9	0.86	3053cm <sup>-1</sup> (Ar C-H	7.93-8.01 (d,2H,CO-
A14(1-(napl	hthalen	-1-yl)-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub>	303	112-115	67.35			str),1663cm <sup>-1</sup> (C=O str),	CH=CH-), 7.23-7.97
3-(3-nitroph	enyl)pi	op-2-							$1449 \text{cm}^{-1}(\text{Ar-C=C str})$	(m, 12H, Ar-H)
en-1-one)	5 /1						A10	0.80	3028cm <sup>-1</sup> (Ar C-H str), 1657	8.01-8.30 (d.2H.CO-
A15(3-(2,4-			C <sub>19</sub> H <sub>12</sub> Cl <sub>2</sub> O	327	78-82	84.43	-		$cm^{-1}$ (C=O str), 1493 cm <sup>-1</sup>	CH=CH-), 7.23-8.75
dichlorophe	nvl)-1-		- 19 12 - 2 -	- ·					$(Ar-C=C str),776 cm^{-1} (C-C)$	(m, 11H, Ar-H)
(naphthalen-	-1-vl)pi	rop-2-							Clstr)	
en-1-one)	5 /1	1					A11	0.67	3049cm <sup>-1</sup> (Ar C-H str), 1660	8.00-8.09(d.2H.CO-
A16(1-(napl	hthalen	-1-vl)-	C21H16O	284	130-132	89.06			$cm^{-1}$ (C=O str). 1459 cm <sup>-1</sup>	CH=CH-). 7.25-7.96
5-phenylpen	nta-2.4-	dien-1-	-2110-						(Ar-C=C str).	(m. 11H. Ar-H)
one)									$1173 \text{ cm}^{-1}$ (C-O-C str)	3.89(s.3H.O-CH3)
A17(1-(napł	nthalen	-2-vl)-	C <sub>10</sub> H <sub>4</sub> O	258	119-121	70.20	A12	0.59	2906cm <sup>-1(</sup> Ar C-H	8 26-8 37(d 2H CO-
3-phenylpro	n-2-en	-1-one)	0191140		117 121	/ 0.20		0.05	str) $1675 \text{cm}^{-1}(\text{C=O str})$	CH=CH-) 7 25-
A18(3-(4-ch	loroph	envl)-	CuHuClO	292	111-114	59 79			$1440 \text{ cm}^{-1}$ (Ar-C=C str)	8 09(m 11H Ar-H)
1-(naphthale	noroph m_?_vľ	)nron-	Cignizero	272		57.17				2 73(s 6H CH3)
2-en-1-one)	211-2-yi	)prop-					A13	0.80	3053cm <sup>-1</sup> (Ar C-H	8 15-8 23(d 2H CO-
$\Delta 19(3-(4-$			ConHuiOo	288	83-86	74 43	110	0.00	$str) 1663 cm^{-1} (C=0 str)$	$CH=CH_{-}$ 7 25-8 17
methoxynhe	nvl)_1_		C201116O2	200	05-00	77.75			$1499 \text{ cm}^{-1} (\text{Ar-C=C str})$	(m 11H Ar-H)
(naphthalen.	-2-vl)ni	ron-2-							$1178 \text{ cm}^{-1}(\text{NO}_{2}\text{str})$	(,,,
en-1-one)	2 J.)p.	lop 2					A14	0.75	3054 cm <sup>-1</sup> (Ar C-H str) 1675	8 34-8 37 (d 2H CO-
A20(3-[4-			CarHieNO	301	62-66	90.16	1111	0.75	$cm^{-1}(C=0 str)$ 1431 cm <sup>-1</sup>	CH=CH-) 7 38-8 23
			021119110	501	02 00	20.10				
(dimethylan	nino)nh	envll-							(Ar-C=C str)	(m 11H Ar-H)
(dimethylam	nino)ph	enyl]-							(Ar-C=C str), 1193 cm <sup>-1</sup> (NO <sub>2</sub> str)	(m, 11H, Ar-H)
(dimethylam 1-(naphthale 2-en-1-one)	nino)ph en-2-yl)	enyl]- )prop-					A15	0.87	(Ar-C=C str), $1193 cm^{-1}(NO_2 str)$ $3056 cm^{-1}(Ar C-H)$	(m, 11H, Ar-H) 7 95-8 00 (d 2H CO-
(dimethylam 1-(naphthale 2-en-1-one)	nino)ph en-2-yl)	enyl]- )prop-	CuHuNO	303	123-126	61.80	A15	0.87	(Ar-C=C str), 1193 cm <sup>-1</sup> (NO <sub>2</sub> str) 3056cm <sup>-1</sup> (Ar C-H str) 1672cm <sup>-1</sup> (C=O	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-) 7 25-7 88
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph	hino)ph en-2-yl) hthalen	enyl]- )prop- -2-yl)-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub>	303	123-126	61.80	A15	0.87	(Ar-C=C str), 1193 cm <sup>-1</sup> (NO <sub>2</sub> str) 3056cm <sup>-1</sup> (Ar C-H str),1672cm <sup>-1</sup> (C=O str) 1463 cm <sup>-1</sup> (Ar-C=C	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m 10HAr-H)
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph	nino)ph en-2-yl) hthalen enyl)pr	enyl]- )prop- -2-yl)- cop-2-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub>	303	123-126	61.80	A15	0.87	$\begin{array}{l} \text{(Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),} 1672\text{cm}^{-1}(\text{C=O} \\ \text{str),} 1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str}) \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H)
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph en-1-one) A22(1-(naph	nino)ph en-2-yl) hthalen enyl)pr	enyl]- )prop- -2-yl)- cop-2-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub>	303	123-126	61.80	A15	0.87	(Ar-C=C  str), $1193 \text{ cm}^{-1}(\text{NO}_2\text{str})$ $3056\text{cm}^{-1}(\text{Ar C-H} \text{ str}),1672\text{cm}^{-1}(C=O \text{ str}),1463 \text{ cm}^{-1}(\text{Ar-C}=C \text{ str}),$ $753 \text{ cm}^{-1}(C-C \text{str})$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H)
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naph 3-(2-nitroph en-1-one) <b>A22</b> (1-(naph 3-(3-nitroph	hino)ph en-2-yl) hthalen enyl)pr hthalen	-2-yl)- cop-2- -2-yl)- cop-2-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub>	303 303	123-126 89-92	61.80 62.66	A15	0.87	(Ar-C=C  str), $1193 \text{ cm}^{-1}(\text{NO}_2\text{str})$ $3056\text{cm}^{-1}(\text{Ar C-H} \text{ str}),1672\text{ cm}^{-1}(C=O \text{ str}),1463 \text{ cm}^{-1}(\text{Ar-C}=C \text{ str}),$ $753 \text{ cm}^{-1}(\text{C-Clstr})$ $3050\text{ cm}^{-1}(\text{Ar C-H} \text{ str}),1650$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d 2H CO-
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naph 3-(2-nitroph en-1-one) <b>A22</b> (1-(naph 3-(3-nitroph en-1-one)	hino)ph en-2-yl) hthalen enyl)pr hthalen enyl)pr	-2-yl)- cop-2- -2-yl)- cop-2-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub>	303 303	123-126 89-92	61.80 62.66	A15	0.87	$\begin{array}{l} (\text{Ar-C=C str}), \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str}), 1672\text{cm}^{-1}(\text{C=O} \\ \text{str}), 1463 \text{ cm}^{-1} (\text{Ar-C=C} \\ \text{str}), \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{cm}^{-1}(\text{Ar C-H str}), 1650 \\ \text{cm}^{-1}(\text{C=O str}) \ 1450 \text{ cm}^{-1} \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-) 7.22-7.72
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naph 3-(2-nitroph en-1-one) <b>A22</b> (1-(naph 3-(3-nitroph en-1-one) <b>A23</b> (3-(2,4-1))	nino)ph en-2-yl) hthalen enyl)pr hthalen enyl)pr	-2-yl)- cop-2- -2-yl)- cop-2-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub>	303 303	123-126 89-92	61.80 62.66	A15	0.87	$\begin{array}{l} (\text{Ar-C=C str}), \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str}), 1672\text{cm}^{-1}(\text{C=O} \\ \text{str}), 1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str}), \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{cm}^{-1}(\text{Ar C-H str}), 1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m 14H Ar-H)
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naph 3-(2-nitroph en-1-one) <b>A22</b> (1-(naph 3-(3-nitroph en-1-one) <b>A23</b> (3-(2,4- dichloropherethylam)	nino)ph en-2-yl] hthalen enyl)pr hthalen enyl)pr	enyl]- )prop- -2-yl)- cop-2- -2-yl)- cop-2-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>12</sub> Cl <sub>2</sub> O	303 303 327	123-126 89-92 129-133	61.80 62.66 63.41	A15 A16	0.87	$\begin{array}{l} (\text{Ar-C=C str}), \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str}), 1672\text{cm}^{-1}(\text{C=O} \\ \text{str}), 1463 \text{ cm}^{-1} (\text{Ar-C=C} \\ \text{str}), \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{cm}^{-1}(\text{Ar C-H str}), 1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{cm}^{-1}(\text{Ar C-H str}), 1663 \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO-
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naph 3-(2-nitroph en-1-one) <b>A22</b> (1-(naph 3-(3-nitroph en-1-one) <b>A23</b> (3-(2,4- dichloropher (naphthalen)	nino)ph en-2-yl) hthalen enyl)pr hthalen enyl)pr nyl)-1-	rop-2- rop-2- rop-2-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>12</sub> Cl <sub>2</sub> O	303 303 327	123-126 89-92 129-133	61.80 62.66 63.41	A15 A16 A17	0.87	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}) \\ 1499 \text{ cm}^{-1} \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-) 7.25-
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naphthale a-(2-nitroph en-1-one) <b>A22</b> (1-(naphthale a-(3-nitroph en-1-one) <b>A23</b> (3-(2,4- dichloropher (naphthalen- en-1-one)	nino)ph en-2-yl) hthalen enyl)pr hthalen enyl)pr nyl)-1- -2-yl)pr	rop-2- rop-2-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>12</sub> Cl <sub>2</sub> O	303 303 327	123-126 89-92 129-133	61.80 62.66 63.41	A15 A16 A17	0.87	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str),1650} \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str),1663} \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m 12H Ar-H)
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naph 3-(2-nitroph en-1-one) <b>A22</b> (1-(naph 3-(3-nitroph en-1-one) <b>A23</b> (3-(2,4- dichloropher (naphthalen- en-1-one) <b>A24</b> (1-(naph	nino)ph en-2-yl) hthalen enyl)pr hthalen enyl)pr nyl)-1- -2-yl)pr	rop-2- -2-yl)- rop-2- rop-2- -2-yl)- rop-2-	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$	303 303 327 284	123-126 89-92 129-133	61.80 62.66 63.41	A15 A16 A17	0.87	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d 2H CO-
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naph 3-(2-nitroph en-1-one) <b>A22</b> (1-(naph 3-(3-nitroph en-1-one) <b>A23</b> (3-(2,4- dichlorophene (naphthalen- en-1-one) <b>A24</b> (1-(naph <b>5</b> , nhenylapen	nino)ph en-2-yl) nthalen enyl)pr hthalen enyl)pr nyl)-1- -2-yl)pr hthalen	rop-2- -2-yl)- rop-2- rop-2- -2-yl)- -2-yl)- dian-1-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>12</sub> Cl <sub>2</sub> O C <sub>21</sub> H <sub>16</sub> O	303 303 327 284	123-126 89-92 129-133 68-72	61.80 62.66 63.41 69.22	A15 A16 A17 A18	0.87 0.77 0.78 0.84	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(napl 3-(2-nitroph en-1-one) <b>A22</b> (1-(napl 3-(3-nitroph en-1-one) <b>A23</b> (3-(2,4- dichloropher (naphthalen- en-1-one) <b>A24</b> (1-(napl 5-phenylpen one)	nino)ph en-2-yl] nthalen enyl)pr hthalen enyl)pr nyl)-1- -2-yl)pr hthalen ita-2,4-	rop-2- -2-yl)- -2-yl)- rop-2- rop-2- -2-yl)- dien-1-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>12</sub> Cl <sub>2</sub> O C <sub>21</sub> H <sub>16</sub> O	303 303 327 284	123-126 89-92 129-133 68-72	61.80 62.66 63.41 69.22	A15 A16 A17 A18	0.87 0.77 0.78 0.84	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{C-C str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1653 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1} \text{ (Ar-C=C str)}, 756 \text{ cm}^{-1} \\ (\text{C-Clstr}) \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m 11H Ar-H)
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(napl 3-(2-nitroph en-1-one) <b>A22</b> (1-(napl 3-(3-nitroph en-1-one) <b>A23</b> (3-(2,4- dichloropher (naphthalen- en-1-one) <b>A24</b> (1-(napl 5-phenylpen one)	nino)ph en-2-yl] nthalen enyl)pr hthalen nyl)-1- -2-yl)pr hthalen nta-2,4-	rop-2- -2-yl)- -2-yl)- -2-yl)- rop-2- -2-yl)- dien-1-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>12</sub> Cl <sub>2</sub> O C <sub>21</sub> H <sub>16</sub> O	303 303 327 284	123-126 89-92 129-133 68-72	61.80 62.66 63.41 69.22	A15 A16 A17 A18	0.87 0.77 0.78 0.84 0.80	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ \text{i}(\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1} \text{ (Ar-C=C str)}, 756 \text{ cm}^{-1} \\ \text{i}(\text{C-Clstr}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d 2H CO-
(dimethylam 1-(naphthale 2-en-1-one) <b>A21</b> (1-(naph 3-(2-nitroph en-1-one) <b>A22</b> (1-(naph 3-(3-nitroph en-1-one) <b>A23</b> (3-(2,4- dichloropher (naphthalen- en-1-one) <b>A24</b> (1-(naph 5-phenylpen one)	nino)ph en-2-yl) nthalen enyl)pr hthalen enyl)pr -2-yl)pr hthalen ita-2,4-	rop-2- -2-yl)- -2-yl)- rop-2- rop-2- -2-yl)- dien-1-	C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>13</sub> NO <sub>3</sub> C <sub>19</sub> H <sub>12</sub> Cl <sub>2</sub> O C <sub>21</sub> H <sub>16</sub> O	303 303 327 284	123-126 89-92 129-133 68-72	61.80 62.66 63.41 69.22	A15 A16 A17 A18 A19	0.87 0.77 0.78 0.84 0.80	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 756 \text{ cm}^{-1} \\ (\text{C-Clstr}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph en-1-one) A22(1-(naph 3-(3-nitroph en-1-one) A23(3-(2,4- dichloropher (naphthalen- en-1-one) A24(1-(naph 5-phenylpen one) Table 2	nino)ph en-2-yl) nthalen enyl)pr hthalen enyl)pr -2-yl)pr hthalen nta-2,4-	enyl]- )prop- -2-yl)- cop-2- -2-yl)- cop-2- -2-yl)- dien-1-	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s	303 303 327 284 ynthesize	123-126 89-92 129-133 68-72	61.80 62.66 63.41 69.22 inds	A15 A16 A17 A18 A19	0.87 0.77 0.78 0.84 0.80	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ \text{i}(\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1} \text{ (Ar-C=C str)} \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1} \text{ (Ar-C=C str),} 1173 \text{ cm}^{-1} \\ \text{i}(\text{C-O} \text{ cstr}) \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m 11H Ar-H)
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph en-1-one) A22(1-(naph 3-(3-nitroph en-1-one) A23(3-(2,4- dichloropher (naphthalen- en-1-one) A24(1-(naph 5-phenylpen one) Table 2 Compounds	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr -2-yl)pr nthalen nta-2,4- : Anal R <sub>f</sub>	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- <u>ytical I</u> ATR	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s	303 303 327 284 ynthesize	123-126 89-92 129-133 68-72 ed compou 4R(CDCI3	61.80 62.66 63.41 69.22 inds	A15 A16 A17 A18 A19	0.87 0.77 0.78 0.84 0.80	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ \text{i}(\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1} \text{ (Ar-C=C str)} \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1} \text{ (Ar-C=C str)} \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1173 \text{ cm}^{-1} \\ \text{i}(\text{C-O-C str}) \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (c 3H OCH3)
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph en-1-one) A22(1-(naph 3-(3-nitroph en-1-one) A23(3-(2,4- dichloropher (naphthalen- en-1-one) A24(1-(naph 5-phenylpen one) Table 2	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr -2-yl)pr nthalen nta-2,4- : Anal R <sub>r</sub> value	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- <u>ytical I</u> ATR	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s	303 303 327 284 ynthesize	123-126 89-92 129-133 68-72 ed compou 4R(CDC13	61.80 62.66 63.41 69.22 inds	A15 A16 A17 A18 A19	0.87 0.77 0.78 0.84 0.80 0.69	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ \text{(Ar-C=C str)} \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1} \text{ (Ar-C=C str)} \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1540 \\ \text{cm}^{-1} \text{ (Ar-C=C str)}, 1510 \\ \text{cm}^{-1} \text{ (Ar-C=C str)} \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1173 \text{ cm}^{-1} \\ \text{(C-O-C str)} \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8 11-8 27(d 2H CO-
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph en-1-one) A22(1-(naph 3-(3-nitroph en-1-one) A23(3-(2,4- dichloropher (naphthalen- en-1-one) A24(1-(naph 5-phenylpen one) Table 2 Compounds A1	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- : Anal R <sub>r</sub> value 0.82	enyl]- )prop- -2-yl)- cop-2- rop-2- -2-yl)- dien-1- <u>ytical I</u> ATR 3059cm	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s	303 303 327 284 ynthesize NN ), 7.8	123-126 89-92 129-133 68-72 ed compou 4R(CDCl3	61.80 62.66 63.41 69.22 inds ) δ	A15 A16 A17 A18 A19 A20	0.87 0.77 0.78 0.84 0.80 0.69	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1566 \text{ cm}^{-1} \\ (\text{C-Clstr}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{C-O-C str}) \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25-
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph en-1-one) A22(1-(naph 3-(3-nitroph en-1-one) A23(3-(2,4- dichloropher (naphthalen- en-1-one) A24(1-(naph 5-phenylpen one) Table 2 Compounds A1	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- <b>:</b> Anal R <sub>r</sub> value 0.82	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- <u>ytical I</u> ATR 3059cm 1680 cm	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s	303 303 327 284 284 ), 7.8 1448 CF	123-126 89-92 129-133 68-72 ed compou 4R(CDCl3 22-7.94 (d,2 I=CH-), 7.1	61.80 62.66 63.41 69.22 inds ) δ 2H,CO- 15-7.97	A15 A16 A17 A18 A19 A20	0.87 0.77 0.78 0.84 0.80 0.69	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ \text{(Ar-C=C str)} \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1} \text{ (Ar-C=C str)} \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1} \text{ (Ar-C=C str)}, 1173 \text{ cm}^{-1} \\ \text{(C-O-C str)} \\ \\ 2899\text{cm}^{-1}(\text{Ar C-H str}), 1674 \\ \text{cm}^{-1}(\text{C=O str}), 1437\text{cm}^{-1} \\ (\text{Ar-C=C str}) \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25- 7.99(m, 11H Ar-H)
(dimethylam 1-(naphthale 2-en-1-one) A21(1-(naph 3-(2-nitroph en-1-one) A22(1-(naph 3-(3-nitroph en-1-one) A23(3-(2,4- dichlorophen (naphthalen- en-1-one) A24(1-(naph 5-phenylpen one) Table 2 Compounds A1	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- : Anal R <sub>f</sub> value 0.82	enyl]- )prop- -2-yl)- cop-2- -2-yl)- dien-1- <u>ytical I</u> ATR 3059cm <sup>-1</sup> 1680 cm cm <sup>-1</sup> (Ar	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s	303 303 327 284 ), 7.8 1448 CF (m	123-126 89-92 129-133 68-72 68-72 ed compou 4R(CDCI3 22-7.94 (d,2 I=CH-), 7.1 , 10H, Ar-I	61.80 62.66 63.41 69.22 inds ) δ 2H,CO- 15-7.97 1)	A15 A16 A17 A18 A19 A20	0.87 0.77 0.78 0.84 0.80 0.69	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1} \text{ (Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1} \text{ (Ar-C=C str)} \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1} \text{ (Ar-C=C str)}, 1173 \text{ cm}^{-1} \\ (\text{C-Clstr}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1173 \text{ cm}^{-1} \\ (\text{C-O-C str}) \\ \\ 2899\text{cm}^{-1}(\text{Ar C-H str}), 1674 \\ \text{cm}^{-1}(\text{C=O str}), 1437\text{cm}^{-1} \\ (\text{Ar-C=C str}) \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25- 7.99(m,11H.Ar-H), 2 73(s 6H CH3)
(dimethylam         1-(naphthale         2-en-1-one)         A21(1-(napl         3-(2-nitroph         en-1-one)         A22(1-(napl         3-(3-nitroph         en-1-one)         A23(3-(2,4-         dichloropher         (naphthalen-         en-1-one)         A24(1-(napl         5-phenylpen         one)         Table 2         Compounds         A1	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- : Anal R <sub>r</sub> value 0.82	enyl]- )prop- -2-yl)- cop-2- -2-yl)- dien-1- <u>ytical I</u> ATR 3059cm <sup>-1</sup> 1680 cm <u>cm<sup>-1</sup> (Ar</u> 1667 cm	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the state of the stat	303 303 327 284 ), 7.8 1448 CF (m 1489 7.8	123-126 89-92 129-133 68-72 68-72 cd compou 4R(CDCl3 22-7.94 (d,2 I=CH-), 7.1 , 10H, Ar-H 3-7.93 (d,2	61.80 62.66 63.41 69.22 inds ) δ PH,CO- 15-7.97 H) PH,CO-	A15 A16 A17 A18 A19 A20	0.87 0.77 0.78 0.84 0.80 0.69	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{C-O-C str}) \\ 2899\text{cm}^{-1}(\text{Ar C-H str}), 1674 \\ \text{cm}^{-1}(\text{C=O str}), 1437\text{cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1676 \text{ cm}^{-1}(\text{C=O str}), 1264 \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25- 7.99(m,11H.Ar-H), 2.73(s,6H,CH3) 8.15 8.23(d,2H,CO-
(dimethylam         1-(naphthale         2-en-1-one)         A21(1-(napl         3-(2-nitroph         en-1-one)         A22(1-(napl         3-(3-nitroph         en-1-one)         A23(3-(2,4-         dichloropher         (naphthalen-         en-1-one)         A24(1-(napl         5-phenylpen         one)         Table 2         Compounds         A1	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- : Anal R <sub>f</sub> value 0.82	enyl]- )prop- -2-yl)- cop-2- -2-yl)- dien-1- <u>ytical I</u> ATR 3059cm <sup>-1</sup> 1680 cm cm <sup>-1</sup> (Ar 1667 cm cm <sup>-1</sup> (Ar	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ $C_{22}H_{16}O$ $C_{21}H_{16}O$ $C_{22}H_{16}O$ $C_{21}H_{16}O$ $C_{22}H_{16}O$ $C_{21}H_{16}O$ $C_{22}H$	303 303 327 284 ), 7.8 1448 CF (m 1489 7.8 8 cm CF	123-126 89-92 129-133 68-72 68-72 68-72 22-7.94 (d,2 1=CH-), 7.1 3-7.93 (d,2 1=CH-), 7.3	61.80 62.66 63.41 69.22 inds ) δ 2H,CO- 15-7.97 1) H,CO- 22-7.97	A15 A16 A17 A18 A19 A20 A21	0.87 0.77 0.78 0.84 0.80 0.69 0.78	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{C-Clstr}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{C-O-C str}) \\ \\ 2899\text{cm}^{-1}(\text{Ar C-H str}), 1674 \\ \text{cm}^{-1}(\text{C=O str}), 1437\text{cm}^{-1} \\ (\text{Ar-C=C str}) \\ \hline 1676 \text{ cm}^{-1}(\text{C=O str}), 1364 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1278 \text{ cm}^{-1} \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25- 7.99(m,11H.Ar-H), 2.73(s,6H,CH3) 8.15-8.23(d,2H,CO- CH=CH-),7.25- 7.99
(dimethylam       1-(naphthale       2-en-1-one)       A21(1-(napl       3-(2-nitroph       en-1-one)       A22(1-(napl       3-(3-nitroph       en-1-one)       A23(3-(2,4-       dichloropher       (naphthalen-       en-1-one)       A24(1-(napl       5-phenylpen       one)       Table 2       Compounds       A1	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- <b>:</b> Anal R <sub>f</sub> value 0.82	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- <u>-2-yl)-</u> dien-1- <u>-2-yl)-</u> dien-1- <u>-2-yl)-</u> dien-1- <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u> <u>-2-yl)-</u>	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $c_{10}^{1}(Ar-C-H sth)$ $c_{10}^{-1}(C=O str),$ $c_{10}^{-1}(C=O str),$ $c_{10}^{-1}(C=O str),$ $c_{10}^{-1}(C=O str),$ $c_{10}^{-1}(C=O str),$	303 303 327 284 284 284 284 284 284 284 284 284 284	123-126 89-92 129-133 68-72 68-72 68-72 22-7.94 (d,2 1=CH-), 7.1 3-7.93 (d,2 1=CH-), 7.3 9H, Ar-H	61.80 62.66 63.41 69.22 inds ) δ PH,CO- 15-7.97 4) PH,CO- 22-7.97 )	A15 A16 A17 A18 A19 A20 A21	0.87 0.77 0.78 0.84 0.80 0.69 0.78	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{C-O-C str}) \\ 1663 \text{ cm}^{-1}(\text{Ar C-H str}), 1674 \\ \text{cm}^{-1}(\text{C=O str}), 1437\text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1676 \text{ cm}^{-1}(\text{C=O str}), 1364 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1278 \text{ cm}^{-1} \\ (\text{NOc-str}) \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25- 7.99(m,11H.Ar-H), 2.73(s,6H,CH3) 8.15-8.23(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H)
(dimethylam       1-(naphthale       2-en-1-one)       A21(1-(naph       3-(2-nitroph       en-1-one)       A22(1-(naph       3-(3-nitroph       en-1-one)       A23(3-(2,4-       dichloropher       (naphthalen-       en-1-one)       A24(1-(naph       5-phenylpen       one)       Table 2       Compounds       A1       A2       A3	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- : Anal R <sub>f</sub> value 0.82 0.64 0.73	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- dien-1- MTR 3059cm 1680 cm cm <sup>-1</sup> (Ar 1667 cm cm <sup>-1</sup> (Ar 1662 cm	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $c_{10}^{-1}(C=O \text{ str}),$ $c_{10}^{-1}(C=O \text{ str}),$ $c_{10}^{-1}(C=O \text{ str}),$ $c_{10}^{-1}(C=O \text{ str}),$	303 303 327 284 284 284 284 7, 8 1448 7, 8 8 cm 2, 7, 8 1448 2, 7, 8 1448 2, 7, 8 1448 2, 7, 8 1448 2, 7, 8 1448 2, 7 1448 2, 7 14 1448 2, 7 14 1448 2, 7 14 1448 2, 7 14 1448 2, 7 14 14 14 14 14 14 14 14 14 14 14 14 14	123-126 89-92 129-133 68-72 68-72 68-72 22-7.94 (d,2 1=CH-), 7.1 3-7.93 (d,2 1=CH-), 7.3 9H, Ar-H 3-7.94 (d,2 1=CH-), 7.3	61.80 62.66 63.41 69.22 inds ) δ PH,CO- 15-7.97 1) PH,CO- 32-7.97 ) PH,CO- 12-7.97	A15 A16 A17 A18 A19 A20 A21	0.87 0.77 0.78 0.84 0.80 0.69 0.78	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{C-Clstr}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1173 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 2899\text{cm}^{-1}(\text{Ar C-H str}), 1674 \\ \text{cm}^{-1}(\text{C=O str}), 1437\text{cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1676 \text{ cm}^{-1}(\text{C=O str}), 1278 \text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H), 2.73(s,6H,CH3) 8.15-8.23(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H)
A1         1-(naphthale         2-en-1-one)         A21(1-(naph         3-(2-nitroph         en-1-one)         A22(1-(naph         3-(3-nitroph         en-1-one)         A23(3-(2,4-         dichloropher         (naphthalen-         en-1-one)         A24(1-(naph         5-phenylpen         one)         Table 2         Compounds         A1         A2         A3	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- : Anal R <sub>f</sub> value 0.82 0.64 0.73	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- ytical I ATR 3059cm <sup>-1</sup> 1680 cm cm <sup>-1</sup> (Ar 1667 cm cm <sup>-1</sup> (Ar 1682 cm cm <sup>-1</sup> (Ar	$C_{19}H_{13}NO_{3}$ $C_{19}H_{13}NO_{3}$ $C_{19}H_{12}Cl_{2}O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_{2}O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{10}Cl_{2}O$ $C_{21}H_{10}O$	303 303 327 284 284 284 (m 1489 7.8 1448 (m 1489 7.8 8 cm CF (m 1594 7.8 1594 7.8 CF (m CF (m) (m) (m) (m) (m) (m) (m) (m)	123-126 89-92 129-133 68-72 68-72 cd compou AR(CDCI3 22-7.94 (d,2 I=CH-), 7.1 3-7.93 (d,2 I=CH-), 7.3 9H, Ar-H 3-7.94 (d,2 I=CH-), 7.3	61.80 62.66 63.41 69.22 inds ) δ PH,CO- 15-7.97 1) PH,CO- 32-7.97 ) PH,CO- 32-7.97 )	A15         A16         A17         A18         A19         A20         A21         A22	0.87 0.77 0.78 0.84 0.80 0.69 0.78 0.68	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str),1650} \\ \text{cm}^{-1}(\text{C=O str), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str),1663} \\ \text{cm}^{-1}(\text{C=O str), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1173 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ \hline 1676 \text{ cm}^{-1}(\text{C=O str}), 1278 \text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1170 \text{ cm}^{-1}(\text{Ar-C=C str}) \\ 1170 \text{ cm}^{-1}(\text{Ar-C=C str}) \\ \hline 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1170 \text{ cm}^{-1}(\text{Ar-C=C str}) \\ 1170 \text{ cm}^{-1}(\text{Ar-C=C str}) \\ \hline 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ \hline 1170 \text{ cm}^{-1}(\text{Ar-C=C str}) \\ \hline 1000 \text{ cm}^{-1}(\text{Ar-C=C str}), 1170 \text{ cm}^{-1}(\text{Ar-C=C str}) \\ \hline 1000 \text{ cm}^{-1}(\text{Ar-C=C str}), 1170 \text{ cm}^{-1}(\text{Ar-C=C str}) \\ \hline 1000 \text{ cm}^{-1}(\text{Ar-C=C str}), 1170 \text{ cm}^$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H), 2.73(s,6H,CH3) 8.15-8.23(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98
(dimethylam       1-(naphthale       2-en-1-one)       A21(1-(naph       3-(2-nitroph       en-1-one)       A22(1-(naph       3-(3-nitroph       en-1-one)       A23(3-(2,4-       dichloropher       (naphthalen-       en-1-one)       A24(1-(naph       5-phenylpen       one)       Table 2       Compounds       A1       A2	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- : Anal R <sub>f</sub> value 0.82 0.64 0.73	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- ytical I ATR 3059cm <sup>-1</sup> 1680 cm cm <sup>-1</sup> (Ar 1667 cm cm <sup>-1</sup> (Ar 1682 cm cm <sup>-1</sup> (Ar 1682 cm cm <sup>-1</sup> (Ar 1682 cm cm <sup>-1</sup> (Ar	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ $C_{21}H_{16}O$ $C_{20}H$	303 303 327 284 284 284 284 (m) 1448 (m) 1448 (m) 1489 7.8 8 cm <sup>-</sup> (m) 1594 7.8 (m) (m) 1594 7.8 (m) (m) (m) (m) (m) (m) (m) (m)	123-126 89-92 129-133 68-72 68-72 68-72 68-72 22-7.94 (d,2 1=CH-), 7.3 , 10H, Ar-H 3-7.93 (d,2 1=CH-), 7.3 , 9H, Ar-H 3-7.94 (d,2 1=CH-), 7.3 , 9H, Ar-H	61.80 62.66 63.41 69.22 inds ) δ PH,CO- 15-7.97 1) PH,CO- 32-7.97 ) PH,CO- 32-7.97 )	A15         A16         A17         A18         A19         A20         A21         A22	0.87 0.77 0.78 0.84 0.80 0.69 0.78 0.68	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str}),1650 \\ \text{cm}^{-1}(\text{C=O str}), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str}),1663 \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1278 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1676 \text{ cm}^{-1}(\text{C=O str}), 1364 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1278 \text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179 \text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.34-7.99 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H)
(dimethylam       1-(naphthale       2-en-1-one)       A21(1-(naph       3-(2-nitroph       en-1-one)       A22(1-(naph       3-(3-nitroph       en-1-one)       A23(3-(2,4-       dichloropher       (naphthalen-       en-1-one)       A24(1-(naph       5-phenylpen       one)       Table 2       Compounds       A1       A2	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- <b>:</b> Anal R <sub>f</sub> value 0.82 0.64 0.73	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- ytical I ATR 3059cm <sup>-1</sup> 1680 cm cm <sup>-1</sup> (Ar 1667 cm cm <sup>-1</sup> (Ar 1622 cm cm <sup>-1</sup> (Ar 1622 cm cm <sup>-1</sup> (Ar	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ $C_{20}H_{16}O$	303 303 327 284 284 284 284 284 284 0 0 0 0 0 0 0 0 0 0 0 0 0	123-126 89-92 129-133 68-72 68-72 68-72 68-72 22-7.94 (d,2 I=CH-), 7.1 3-7.93 (d,2 I=CH-), 7.3 9H, Ar-H 3-7.94 (d,2 I=CH-), 7.3 9H, Ar-H 3-7.94 (d,2 I=CH-), 7.3 9H, Ar-H 3-7.94 (d,2 I=CH-), 7.3 9H, Ar-H	61.80 62.66 63.41 69.22 inds ) δ 2H,CO- 15-7.97 1) 2H,CO- 32-7.97 ) 2H,CO- 32-7.97 ) 2H,CO- 32-7.97 ) 2H,CO- 32-7.97 )	A15         A16         A17         A18         A19         A20         A21         A22	0.87 0.77 0.78 0.84 0.80 0.69 0.78 0.68	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str), 1672\text{ cm}^{-1}(\text{C=O} \\ \text{str), 1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str), 1650} \\ \text{cm}^{-1}(\text{C=O str), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str), 1663} \\ \text{cm}^{-1}(\text{C=O str}), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{C=O str}), 1437\text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1676 \text{ cm}^{-1}(\text{C=O str}), 1364 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1278 \text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1662 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1662 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ \end{array}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.02-810 (d-2H-CO-
Alignmethylam       1-(naphthale       2-en-1-one)       A21(1-(naph       3-(2-nitroph       en-1-one)       A22(1-(naph       3-(3-nitroph       en-1-one)       A23(3-(2,4-       dichloropher       (naphthalen-       en-1-one)       A24(1-(naph       5-phenylpen       one)       Table 2       Compounds       A1       A2       A3	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- <b>:</b> Anal R <sub>f</sub> value 0.82 0.64 0.73 0.73	enyl]- )prop- -2-yl)- rop-2- rop-2- -2-yl)- dien-1- ytical I ATR 3059cm <sup>-1</sup> (Ar 1680 cm cm <sup>-1</sup> (Ar 1682 cm cm <sup>-1</sup> (Ar 1622 cm cm <sup>-1</sup> (Ar 1622 cm cm <sup>-1</sup> (Ar 1620 cm 1620 cm	$C_{19}H_{13}NO_3$ $C_{19}H_{13}NO_3$ $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{19}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_2O$ $C_{21}H_{16}O$ $C_{20}H_{16}O$	303 303 303 327 284 284 284 284 0,1650 8.1	123-126 89-92 129-133 68-72 68-72 68-72 68-72 22-7.94 (d,2 I=CH-), 7.1 3-7.93 (d,2 I=CH-), 7.3 9H, Ar-H 3-7.94 (d,2 I=CH-), 7.3 9H, Ar-H 3-7.94 (d,2 I=CH-), 7.3 9H, Ar-H 3-7.94 (d,2 I=CH-), 7.3 9H, Ar-H 9(s, 3H,O- 1-8.26 (d,2) 1-8.26 (d,2) 1-9.26 (d,2) 1-9.	61.80 62.66 63.41 69.22 inds ) δ 2H,CO- 15-7.97 1) 2H,CO- 32-7.97 ) 2H,CO- 32-7.97 ) 2H,CO- 39-7.96 ), CH3) 2H,CO-	A15         A16         A17         A18         A19         A20         A21         A22         A23	0.87 0.77 0.78 0.84 0.84 0.80 0.69 0.78 0.68 0.78	$\begin{array}{l} (Ar-C=C \ str), \\ 1193 \ cm^{-1}(NO_2 \ str) \\ 3056 \ cm^{-1}(Ar \ C-H \ str), 1672 \ cm^{-1}(C=O \ str), 1463 \ cm^{-1} \ (Ar-C=C \ str), \\ 753 \ cm^{-1}(C-Cl \ str) \\ 3050 \ cm^{-1}(Ar \ C-H \ str), 1650 \ cm^{-1}(C=O \ str), 1450 \ cm^{-1} \ (Ar-C=C \ str) \\ 3053 \ cm^{-1}(Ar \ C-H \ str), 1653 \ cm^{-1}(C=O \ str), 1499 \ cm^{-1} \ (Ar-C=C \ str) \\ 1660 \ cm^{-1}(C=O \ str), 1499 \ cm^{-1} \ (Ar-C=C \ str), 1488 \ cm^{-1} \ (Ar-C=C \ str), 1478 \ cm^{-1} \ (Ar-C=C \ str), 1510 \ cm^{-1} \ (Ar-C=C \ str), 1173 \ cm^{-1} \ (C-O-C \ str) \\ 1663 \ cm^{-1}(C=O \ str), 1173 \ cm^{-1} \ (Ar-C=C \ str), 1173 \ cm^{-1} \ (Ar-C=C \ str), 1173 \ cm^{-1} \ (Ar-C=C \ str), 1278 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1278 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1662 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \\ 1669 \ cm^{-1}(C=O \ str), 1179 \ cm^{-1} \ (NO_2 \ str) \ (NO$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.02-810 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.02-810 (d,2H,CO- CH=CH-),7.25-7.98
Alignmethylam       1-(naphthale       2-en-1-one)       A21(1-(naph       3-(2-nitroph       en-1-one)       A22(1-(naph       3-(3-nitroph       en-1-one)       A23(3-(2,4-       dichloropher       (naphthalen-       en-1-one)       A24(1-(naph       5-phenylpen       one)       Table 2       Compounds       A1       A2       A3	nino)ph en-2-yl) nthalen enyl)pr nthalen enyl)pr nyl)-1- -2-yl)pr nthalen nta-2,4- <b>:</b> Anal R <sub>f</sub> value 0.82 0.64 0.73	enyl]- )prop- -2-yl)- rop-2- -2-yl)- dien-1- -2-yl)- dien-1- -2-yl)- dien-1- -2-yl)- dien-1- -2-yl)- dien-1- -2-yl)- dien-1- -2-yl)- -2-yl)- dien-1- -2-yl)- -2-yl)- dien-1- -2-yl)- -2-yl)- dien-1- -2-yl)	$C_{19}H_{13}NO_{3}$ $C_{19}H_{13}NO_{3}$ $C_{19}H_{12}Cl_{2}O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_{2}O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{12}Cl_{2}O$ $C_{21}H_{16}O$ Data of the s $C_{10}H_{10}O$ $C_{20}H_{10}O$ $C_{20}$	303 303 303 327 284 284 284 284 (m 1489 7.8 8 cm <sup>-</sup> CF (m 1594 7.8 8 cm <sup>-</sup> CF (m 3.8 0,1650 8.1 CF	123-126 89-92 129-133 68-72 68-72 68-72 68-72 68-72 68-72 129-133 68-72 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 68-72 129-133 129-133 68-72 129-133 129-134 129-135 129-155 129-15	61.80 62.66 63.41 69.22 inds ) δ 2H,CO- 15-7.97 1) 2H,CO- 32-7.97 ] 2H,CO- 32-7.97 ] 2H,CO- 32-7.96 ] 2H,CO- 32-7.90 ] 2H,CO- 32-7.90 ] 2H,CO- 32-7.90 ] 2H,CO- 30-7.90 ] 3H,CO- 30-7.90 ] 3H,CO- 30-7.90 ] 3H,CO- 30-7.90 ] 3H,CO- 30-7.90 ] 3H,CO- 3	A15         A16         A17         A18         A19         A20         A21         A22         A23	0.87 0.77 0.78 0.84 0.84 0.80 0.69 0.78 0.68 0.78	$\begin{array}{l} (\text{Ar-C=C str),} \\ 1193 \text{ cm}^{-1}(\text{NO}_2\text{str}) \\ 3056\text{cm}^{-1}(\text{Ar C-H} \\ \text{str),1672\text{ cm}^{-1}(\text{C=O} \\ \text{str),1463 \text{ cm}^{-1}(\text{Ar-C=C} \\ \text{str),} \\ 753 \text{ cm}^{-1}(\text{C-Clstr}) \\ 3050\text{ cm}^{-1}(\text{Ar C-H str),1650} \\ \text{cm}^{-1}(\text{C=O str), 1450 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 3053\text{ cm}^{-1}(\text{Ar C-H str),1663} \\ \text{cm}^{-1}(\text{C=O str), 1499 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1660 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1448 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1510 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1173 \text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1663 \text{ cm}^{-1}(\text{C=O str}), 1510 \\ \text{cm}^{-1}(\text{C=O str}), 1437\text{ cm}^{-1} \\ (\text{Ar-C=C str}) \\ 1676 \text{ cm}^{-1}(\text{C=O str}), 1364 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1278 \text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1662 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{C-C=Str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{Ar-C=C str}), 1179\text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{C-C=Str}), 1278 \text{ cm}^{-1} \\ (\text{NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{C-C=Str}), 1179\text{ cm}^{-1} \\ \text{(NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{C-C=Str}), 1278 \text{ cm}^{-1} \\ \text{(NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 1526 \\ \text{cm}^{-1}(\text{C-C=Str}), 1278 \text{ cm}^{-1} \\ \text{(NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 126 \\ \text{cm}^{-1}(\text{C-C=Str}), 1278 \text{ cm}^{-1} \\ \text{(NO}_2\text{str}) \\ 1669 \text{ cm}^{-1}(\text{C=O str}), 126 \\ \text{cm}^{-1}(\text{C-C=Str}), 126 \\ \text{cm}^{-1}(\text{C-C=Str}$	(m, 11H, Ar-H) 7.95-8.00 (d,2H,CO- CH=CH-),7.25-7.88 (m,10HAr-H) 7.83-7.86 (d,2H,CO- CH=CH-),7.22-7.72 (m,14H Ar-H) 7.94-8.01(d,2H,CO- CH=CH-),7.25- 7.89(m,12H Ar-H) 7.89-7.95 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H) 8.00-8.04 (d,2H,CO- CH=CH-),7.25-7.84 (m,11H Ar-H), 3.89 (s,3H,OCH3) 8.11-8.27(d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.06 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.00-8.10 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.02-810 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.02-810 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H) 8.02-810 (d,2H,CO- CH=CH-),7.25-7.98 (m,11H Ar-H)

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A24	0.69	3054cm <sup>-1</sup> (Ar C-H str),1661	7.83-7.89 (d,4H,CO-
		cm <sup>-1</sup> (C=O str), 1499cm <sup>-</sup>	CH=CH-),7.24-7.68
		<sup>1</sup> (Ar-C=C str)	(m,12H Ar-H)

# 4. Antimicrobial Activity

All the synthesized compounds have been screened for antibacterial against two Gram positive Bacteria-B.subtilius and S. Aureus and two Gram negative bacteria- E.coli and P.aerogunisona and for antifungal activity against Aspergillus niger using Serial Dilution Method. Ciprofloxacin was used as reference standard for

		(MIC	<u>_)</u>			
	MIC (conc. In µg/ml)					
Compounds	B. Subtilis	S.Aureus	E.Coli	P.Aeroginosa	A.Niger	
A1	8	8	8	8	16	
A2	8	8	8	8	4	
A3	16	8	8	16	4	
A4	16	16	8	8	8	
A5	8	16	16	16	4	
A6	8	8	16	8	4	
A7	8	16	8	8	8	
A8	32	32	32	32	16	
A9	16	8	8	8	8	
A10	8	8	8	8	4	
A11	8	16	8	8	16	
A12	8	16	16	8	16	
A13	16	32	32	16	8	
A14	16	8	16	8	4	
A15	16	32	16	16	4	
A16	32	32	32	32	8	
A17	8	8	8	8	4	
A18	8	8	8	8	4	
A19	8	8	8	16	4	
A20	16	16	8	8	8	
A21	8	16	16	8	4	
A22	8	8	8	8	4	
A23	16	16	8	16	4	
A24	32	32	32	32	8	
Standard	0.2	0.4	0.2	0.2	0.64	

# 5. Result and Discussion

From the above Result, it is found that compounds A1(1,3diphenylprop-2-en-1-one), A2(3-(4-chlorophenyl)-1phenylprop-2-en-1-one), A10(3-(4-chlorophenyl)-1-(naphthalen-1-yl)prop-2-en-1-one), A17(1-(naphthalen-2-yl)-3-phenylprop-2-en-1-one) andA22(1-(naphthalen-2yl)-3-(3-nitrophenyl)prop-2-en-1-one) are comparatively more active than all other compounds, for both Gram-Positive and Gram-Negative bacteria. The Chalcone are found to be more active for Gram-Negative bacteria compare to gram-Positive.

For	the	anti-fungal	activity	compounds	A3(3-(4
meth	oxyph	enyl)-1-pheny	lprop-2-en	-1-one),	A5(3-(2
nitro	pheny	l)-1-phenylpro	p-2-en-1-o	ne),	A6(3-(3
nitro	pheny	l)-1-phenylpro	p-2-en-1-o	ne),	A10(3-(4

antibacterial activity. Ketoconazole was used as reference standard for antifungal activity.

Serial Dilution method is used to determine Minimum Inhibitory Concentration (MIC) of antimicrobial agent to inhibit the microorganisms. This can be achieved by dilution of agents in either agar or broth medium. In the present study, Broth dilution method was used to determine MIC.

Nutrient Broth medium was used for antibacterial activity and Sabouraud medium for antifungal activity. All the synthesized compounds were diluted into 2,4,8, 16,32µg/ml and DMSO was used as control. chlorophenyl)-1-(naphthalen-1-yl)prop-2-en-1-one), A14(1-(naphthalen-1-yl)-3-(3-nitrophenyl)prop-2-en-1-one), A15(3-(2,4-dichlorophenyl)-1-(naphthalen-1-yl)prop-2-en-1-one), A17(1-(naphthalen-2-yl)-3-phenylprop-2-en-1-one), A18(3-(4-chlorophenyl)-1-(naphthalen-2-yl)prop-2-en-1-one), A19(3-(4-methoxyphenyl)-1-(naphthalen-2-yl)prop-2-en-1one), A21(1-(naphthalen-2-yl)-3-(2-nitrophenyl)prop-2-en-1one), A22(1-(naphthalen-2-yl)-3-(3-nitrophenyl)prop-2-en-1one)&A23(3-(2,4-dichlorophenyl)-1-(naphthalen-2-yl)prop-2-en-1-one) are found to be more active than all other compounds. The Chalcone are found to be more active as antifungal than antibacterial.

# 6. Conclusion and Future Scope

Various Chalcone derivatives are synthesized by Claisen-Schmidt Condensation Reaction and evaluated for their antimicrobial activity. The screening of synthesized compounds for antimicrobial activity showed that these compounds have appreciable antimicrobial activity. The results provide insights that will aid the optimization of the Chalcone derivatives for the better activity and may prove helpful for further lead optimization, virtual screening, molecular docking and molecular dynamics studies.

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