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Application of *N*-isocyaniminotriphenyl phosphorane for preparation of heterocyclic acrylate as a key constituent of many industrial and pharmaceutical compounds

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Abstract

2-Hydroxy pyridine undergoes a smooth reaction with electron-deficient acetylenic esters in the presence of *N*-isocyaniminotriphenyl phosphorane under reflux conditions to produce the heterocyclic acrylate compounds in high yields. The acrylate structures with *E/Z* isomers were obtained when the reaction was performed with 4-Hydroxy pyridine and 4-Hydroxy quinazoline, the acrylate structures with *E/Z* isomers were obtained. All compounds have many applications in medicinal and industrial chemistry—configuration of *E/Z* isomers distinguished with nuclear magnetic resonance technique and chemical shift of olefinic proton. The method offers a simple and efficient route for preparing acrylate heterocyclic compared to the other methodologies. The structures of the products were deduced and supported by ^{1}HNMR and IR spectroscopy.

Keywords: *N*-isocyaniminotriphenylphosphorane, Electron-deficient acetylenic esters, Acrylate heterocyclic compounds, 4-Hydroxy pyridine, 4-Hydroxy quinazoline.

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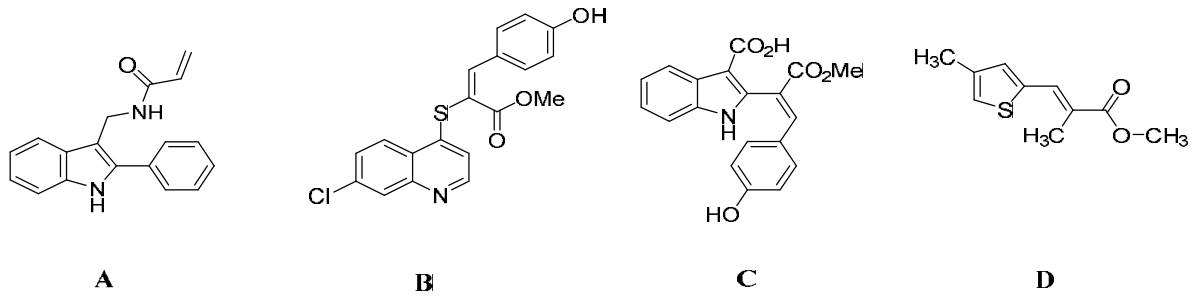
Introduction

Acrylates are important structures in pharmaceutical and polymer compounds. Besides, due to their wide range of applications in various industries, they have special importance. Many chemical compounds efficiently in the synthesis of pharmaceutical compounds and polymers have an acrylic structure [1-3]. For example, acrylates are used in medicinal structures with usages such as anti-microbial [4], anti-asthma [5], anti-depressant [6], anti-bacterial [7], anti-antibiotic [8], anti-tumor [9], anti-tuberculosis [10] and other activities. In addition, the utilization of compounds which are contained acrylates has been also mentioned in various industries such as the oil industry, agriculture, metallurgy, clothing, electrophoresis gels, plastics, resins, or applications such as drug carriers, soft contact lenses, 3D printing, capsular adhesives and so on [11-15]. For instance, compound **A** is used in resins [16], compound **B** has an anti-cancer activity [17], compound **C** (Prenostodione) is evaluated for the antibacterial agent [18] and compound **D** displays antitubercular activity in the field of pharmaceutical study [19].



A **B** **C** **D**

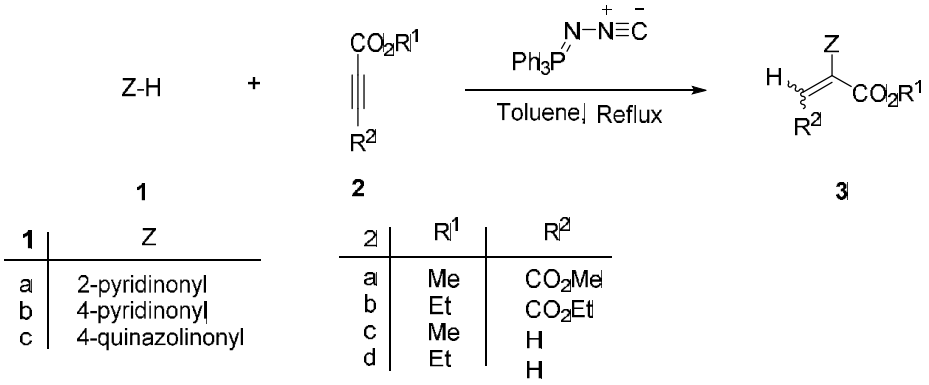
Figure 1. Structure of Compounds A-D.

On the other hand, nitrogen-containing heterocycles perform substantial roles in organic synthesis, agrochemical, pharmaceutical, and materials science industries [20-22]. Among these compounds, 4-quinazolinone, 2-Pyridone, and 4-pyridone are medicinally important nitrogen heterocycles, displaying diverse biological activities including anticonvulsant, anti-hypertensive, anti-cancer [23], anti-diabetic, anti-cholinesterase, dihydrofolate reductase inhibition, cellular phosphorylation inhibition, kinase inhibitory [24], antiproliferative [25], anti-tumor, anti-hepatitis B virus, SARS-CoV-2 main protease inhibitor, anti-inflammatory, analgesic [26], anti-HIV [27], anti-microbial [28], anti-malarial [29], treatment of iron overload in thalassemia major [30], and antibiotic activities [31].

In recent decades, isocyanide chemistry has much attention and found wide applications in organic synthesis and pharmaceutical chemistry. Additionally, functionalized isocyanides were well used as

reactive intermediates in organic synthesis, medicinal chemistry, and polymer science.*N*-isocyaniminotriphenyl phosphorane (PPh_3NNC) is one of the stable functionalized isocyanides derivatives. The unique structure of *N*-isocyaniminotriphenyl phosphorane with diverse and efficient functional groups is an important factor in a broad spectrum of organic synthesis [32, 33].

According to our studies, the achievement of acrylate compounds based on heterocyclic composition through multicomponent reactions led to acrylate structure *E* and *Z* isomers derivatives have been reported. We have described the preparation of acrylate heterocyclic compound derivatives via a one-pot reaction of different N-H acid and acetylenic esters in the presence of triphenylphosphine or isoquinoline as a catalyst [34-39]. In this research, the methodology was improved by utilizing *N*-isocyaniminotriphenyl phosphorane (Scheme 1).



1	Z
a	2-pyridinonyl
b	4-pyridinonyl
c	4-quinazolinonyl

2	R^1	R^2
a	Me	CO_2Me
b	Et	CO_2Et
c	Me	H
d	Et	H

Scheme 1. A typical procedure for the synthesis of **3.**

Experimental

General Procedure

All reagents were obtained from TCM (Japan), Merck (Germany), Fluka (Switzerland), and Aldrich (United States) and used without supernumerary purification. To improve the performance, all solvents were purified and dried by standard technique. The method used to monitor the reactions is TLC and NMR spectroscopy. Infrared (IR) spectra were measured on a Shimadzu IR-460 spectrometer usage KBr disc. ^{1}HNMR spectra were measured acetone-(*d6*) with a Bruker DRX-300 Avance spectrometer at 300MHz. Chemdraw software was employed for naming the structures of the products.

The typical procedure for the preparation of compounds **3**

A solution of acetylenic ester **2** (2 mmol) in toluene (5 ml) was added dropwise to a mixture of *N*-isocyaniminotriphenyl phosphorane (0.5 mmol) and N-H acid **1** (2 mmol)in toluene (10 ml) at room

temperature over 5 minutes. Then the reaction mixture was relaxed and stirred for 6 hours. The solvent was removed under reduced pressure by rotary and the viscous residue was purified by preparative thin layer chromatography (TLC) technique of pre-coated silica gel 20×20 cm glass plates (60 GF_{254}, 0.25mm thickness, Merck), using (hexane: EtOAc 5:1 as eluent) and visualized under 254 nm ultraviolet light. The characterization data of the compounds are given below:

Dimethyl 2-(2-oxopyridin-1(2H)-yl)fumarate **(*Z*)-3a**

Brown oil, Yield 0.38 g (80%). IR (KBr), (ν_{max}, cm^{-1}): 1732 ($C=O_{ester}$), 1662 ($C=O_{amide}$). ^1H NMR (300 MHz, acetone-d_6) δ, ppm: 3.68 (s, 3H, OCH_3), 3.79 (s, 3H, OCH_3), 6.29 (td, ^3J = 6.7 Hz, ^4J= 1.2 Hz, 1H, CH), 6.41 (d, ^3J = 9.4, Hz, 1H, CH), 6.92 (s, 1H, CH), 7.42 (d, ^3J = 6.6 Hz, 1H, CH), 7.49 (td, ^3J = 9.2 Hz, ^4J= 1.9 Hz, 1H, CH).

Dimethyl 2-(2-oxopyridin-1(2H)-yl)maleate **(*E*)-3a**

Brown oil, Yield 0.04 g (10%). IR (KBr), (ν_{max}, cm^{-1}): 1731 ($C=O_{ester}$), 1663 ($C=O_{amide}$). ^1H NMR (300 MHz, acetone-d_6) δ, ppm: 3.66 (s, 3H, OCH_3), 3.80 (s, 3H, OCH_3), 6.28 (td, ^3J = 6.8 Hz, ^4J= 1.3 Hz, 1H, CH), 6.43 (d, ^3J = 9.4, Hz, 1H, CH), 6.67 (s, 1H, CH), 7.40 (d, ^3J = 6.7 Hz, 1H, CH), 7.51 (td, ^3J = 9.1 Hz, ^4J= 1.8 Hz, 1H, CH).

Diethyl 2-(2-oxopyridin-1(2H)-yl)fumarate **(*Z*)-3b**

Brown oil, Yield 0.50 g (95%). IR (KBr), (ν_{max}, cm^{-1}): 1732 ($C=O_{ester}$), 1671 ($C=O_{amide}$). ^1H NMR (300 MHz, acetone-d_6) δ, ppm: 1.16 (t, ^3J = 7.1 Hz, 3H, CH_3), 1.25 (t, ^3J = 7.1 Hz, 3H, CH_3), 4.13 (q, ^3J = 7.1 Hz, 2H,OCH_2), 4.26 (q, ^3J = 7.1 Hz, 2H, OCH_2), 6.26 (t, ^3J = 6.7 Hz, 1H, CH), 6.40 (d, ^3J = 9.3, Hz, 1H, CH), 6.92 (s, 1H, CH), 7.40 (d, ^3J = 6.9, Hz, 1H, CH), 7.49 (t, ^3J = 9.3 Hz, 1H, CH).

Methyl 2-(2-oxopyridin-1(2H)-yl)acrylate **(3c)**

Brown oil, Yield 0.32 g (90%). IR (KBr), (ν_{max}, cm^{-1}): 1738 ($C=O_{ester}$), 1672 ($C=O_{amide}$). ^1H NMR (300 MHz, acetone-d_6) δ, ppm: 3.73 (s, 3H, OCH_3), 5.95 (d, ^3J = 1.1 Hz, 1H, CH), 6.27 (t, ^3J = 6.7 Hz, 1H, CH), 6.30 (d, ^3J = 1.1 Hz, 1H, CH), 6.38 (d, ^3J = 9.0, Hz, 1H, CH), 7.44-7.50 (m, 2H, 2CH).

Ethyl 2-(2-oxopyridin-1(2H)-yl)acrylate **(3d)**

Brown oil, Yield 0.34 g (90%). IR (KBr), (ν_{max}, cm^{-1}): 1733 ($C=O_{ester}$), 1670 ($C=O_{amide}$). ^1H NMR (300 MHz, acetone-d_6) δ, ppm: 1.25 (t, ^3J = 7.1 Hz, 3H, CH_3), 4.20 (q, ^3J = 7.1 Hz, 2H, OCH_2),

5.93 (d, ^3J = 1.1 Hz, 1H, CH), 6.23-6.28 (m, 1H, CH), 6.29 (d, ^3J = 1.1 Hz, 1H, CH), 6.37 (d, ^3J = 9.0, Hz, 1H, CH), 7.43-7.50 (m, 2H, 2CH).

Dimethyl 2-(4-oxopyridin-1(4H)-yl)fumarate **(*Z*)-3e**

Brown oil, Yield 0.42 g (90%). IR (KBr), (ν_{max}, cm^{-1}): 1731 ($C{=}O_{ester}$), 1638 ($C{=}O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 3.72 (s, 3H, OCH_3), 3.87 (s, 3H, OCH_3), 6.18 (d, ^3J = 7.8 Hz, 2H, 2CH), 7.06 (s, 1H, CH), 7.53 (d, ^3J = 7.8 Hz, 2H, 2CH).

Dimethyl 2-(4-oxopyridin-1(4H)-yl)maleate **(*E*)-3e**

Brown oil, Yield 0.02 g (4%). IR (KBr), (ν_{max}, cm^{-1}): 1731 ($C{=}O_{ester}$), 1638 ($C{=}O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 3.77 (s, 3H, OCH_3), 3.93 (s, 3H, OCH_3), 6.23 (d, ^3J = 7.9 Hz, 2H, 2CH), 6.58 (s, 1H, CH), 7.78 (d, ^3J = 7.9 Hz, 2H, 2CH) .

Diethyl 2-(4-oxopyridin-1(4H)-yl)fumarate **(*Z*)-3f**

Brown oil, Yield 0.44 g (83%). IR (KBr), (ν_{max}, cm^{-1}): 1733 ($C{=}O_{ester}$), 1640 ($C{=}O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 1.17 (t, ^3J = 7.1 Hz, 3H, CH_3), 1.29 (t, ^3J = 7.1 Hz, 3H, CH_3), 4.16 (q, ^3J = 7.1 Hz, 2H, OCH_2), 4.33 (q, ^3J = 7.1 Hz, 2H, OCH_2), 6.22 (d, ^3J = 7.8 Hz, 2H, 2CH), 7.07 (s, 1H, CH), 7.56 (d, ^3J = 7.8, Hz, 2H, 2CH).

Diethyl 2-(4-oxopyridin-1(4H)-yl)maleate **(*E*)-3f**

Brown oil, Yield 0.05 g (10%). IR (KBr), (ν_{max}, cm^{-1}): 1733 ($C{=}O_{ester}$), 1640 ($C{=}O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 1.15 (t, ^3J = 7.1 Hz, 3H, CH_3), 1.26 (t, ^3J = 7.1 Hz, 3H, CH_3), 4.22 (q, ^3J = 7.1 Hz, 2H, OCH_2), 4.39 (q, ^3J = 7.1 Hz, 2H,OCH_2), 6.26 (d, ^3J = 7.9 Hz, 2H, 2CH), 6.59 (s, 1H, CH), 7.80 (d, ^3J = 7.9, Hz, 2H, 2CH).

Methyl (E)-3-(4-oxopyridin-1(4H)-yl)acrylate **(3g)**

Brown oil, Yield 0.32 g (90%). IR (KBr), (ν_{max}, cm^{-1}): 1712 ($C{=}O_{ester}$), 1636 ($C{=}O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 3.73 (s, 3H, OCH_3), 6.19-6.23 (m, 1H, CH_{Vinyl}), 6.28 (d, ^3J = 7.9 Hz, 2H, 2CH), 7.87 (d, ^3J = 14.2 Hz, 1H, CH), 8. 09 (d, ^3J = 7.9 Hz, 2H, 2CH).

Ethyl (E)-3-(4-oxopyridin-1(4H)-yl)acrylate **(3h)**

Brown oil, Yield 0.35 g (92%). IR (KBr), (ν_{max}, cm^{-1}): 1708 ($C{=}O_{ester}$), 1669 ($C{=}O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 1.25 (t, ^3J = 7.1 Hz, 3H, CH_3), 4.20 (q, ^3J = 7.1 Hz, 2H, OCH_2),

6.16-6.27 (m, 3H, $1CH_{Vinyl}$ and $2CH_{arom}$), 7.85 (d, ^3J = 14.2 Hz, 1H, CH), 8.07 (d, ^3J = 7.9 Hz, 2H, 2CH).

Dimethyl 2-(4-oxoquinazolin-3(4H)-yl)fumarate **(*Z*)-3i**

Brown oil, Yield 0.26 g (46%). IR (KBr), (ν_{max}, cm^{-1}): 1735 ($C=O_{ester}$), 1686 ($C=O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 3.71 (s, 3H, OCH_3), 3.85 (s, 3H, OCH_3), 7.16 (s, 1H, CH), 7.56-7.66 (m, 1H, CH), 7.76 (d, ^3J = 8.1 Hz, 1H, CH), 7.90 (t, ^3J = 8.4 Hz, 1H, CH), 8.13 (s, 1H, CH), 8.21 (d, ^3J = 7.9 Hz, 1H, CH).

Dimethyl 2-(4-oxoquinazolin-3(4H)-yl)maleate **(*E*)-3i**

Brown oil, Yield 0.24 g (42%). IR (KBr), (ν_{max}, cm^{-1}): 1735 ($C=O_{ester}$), 1686 ($C=O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 3.80 (s, 3H, OCH_3), 3.82 (s, 3H, OCH_3), 6.96 (s, 1H, CH), 7.54-7.65 (m, 1H, CH), 7.75 (d, ^3J = 8.1 Hz, 1H, CH), 7.91 (t, ^3J = 8.4 Hz, 1H, CH), 8.20 (d, ^3J = 7.9 Hz, 1H, CH), 8.33 (s, 1H, CH).

Diethyl 2-(4-oxoquinazolin-3(4H)-yl)fumarate **(*Z*)-3j**

Brown oil, Yield 0.55 g (88%). IR (KBr), (ν_{max}, cm^{-1}): 1730 ($C=O_{ester}$), 1659 ($C=O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 1.07 (t, ^3J = 7.1 Hz, 3H, CH_3), 1.27 (t, ^3J = 7.1 Hz, 3H, CH_3), 4.09 (q, ^3J = 7.1 Hz, 2H, OCH_2), 4.33 (q, ^3J = 7.1 Hz, 2H, OCH_2), 7.18 (d, ^3J = 8.2 Hz, 1H, CH), 7.46 (s, 1H, CH), 7.53 (t, ^3J = 7.5 Hz, 1H, CH), 7.75 (t, ^3J = 8.4 Hz, 1H, CH), 8.20 (d, ^3J = 7.8 Hz, 1H, CH), 8.30 (s, 1H, CH).

Methyl 2-(4-oxoquinazolin-3(4H)-yl)acrylate **(3k)**

Brown oil, Yield 0.42 g (92%). IR (KBr), (ν_{max}, cm^{-1}): 1740 ($C=O_{ester}$), 1678 ($C=O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 3.78 (s, 3H, OCH_3), 6.28 (d, ^3J = 1.0 Hz, 1H, CH), 6.59 (d, ^3J = 1.0 Hz, 1H, CH), 7.57 (d, ^3J = 6.9 Hz, 1H, CH), 7.72 (t, ^3J = 8.0 Hz, 1H, CH), 7.85 (d, ^3J = 7.0 Hz, 1H, CH), 8.18-8.22 (m, 2H, 2CH).

Ethyl 2-(4-oxoquinazolin-3(4H)-yl)acrylate **(3l)**

Brown oil, Yield 0.44 g (90%). IR (KBr), (ν_{max}, cm^{-1}): 1732 ($C=O_{ester}$), 1687 ($C=O_{amide}$). ^{1}H NMR (300 MHz, acetone-d_6) δ, ppm: 1.24 (t, ^3J = 7.1 Hz, 3H, CH_3), 4.25 (q, ^3J = 7.1 Hz, 2H, OCH_2), 6.26 (d, ^3J = 1.0 Hz, 1H, CH), 6.58 (d, ^3J = 1.0 Hz, 1H, CH), 7.50-7.73 (m, 2H, 2CH), 7.88 (td, ^3J = 8.8 Hz, ^4J = 1.5 Hz, 1H, CH), 8.18 (s, 1H, CH), 8.21 (dd, ^3J = 7.9 Hz, ^4J = 1.6 Hz, 1H, CH).

Results and discussion

To optimize the reaction condition (Table 1), N-H acid **(1)** acetylenic esters **(2)** and *N*-isocyaniminotriphenyl phosphorane were chosen as model substrates. We conducted the one-pot reaction in the various solvents and different amounts of *N*-isocyaniminotriphenyl phosphorane as a catalyst.

Table 1. Optimization of reaction conditions.

Entry	Solvent	Time (h)	Temp (°C)	Cat. (mmol)	Yield of **3** (%)
1	EtOH	3	25	0.5	20
2	Toluene	3	25	0.5	38
3	MeCN	3	25	0.5	30
4	CH_2Cl_2	3	25	1	15
5	THF	3	25	1	10
6	DMF	3	25	1	25
7	Toluene	3	reflux	0.5	46
8	MeCN	3	reflux	0.5	35
9	DMF	3	reflux	0.5	32
10	EtOH	3	reflux	0.5	30
11	Toluene	3	reflux	1	48
12	MeCN	3	reflux	1	38
13	DMF	3	reflux	1	34
14	EtOH	3	reflux	1	32
15	**Toluene**	**6**	**reflux**	**0.5**	**95**
16	MeCN	6	reflux	0.5	58
17	DMF	6	reflux	0.5	55
18	EtOH	6	reflux	0.5	50

At first, we tried to study the effect of different solvents such as EtOH, toluene, MeCN, CH_2Cl_2, THF, and DMF with amounts of 0.5 mmol and 1 mmol catalyst (*N*-isocyaniminotriphenyl phosphorane) in a model reaction at room temperature. The best result was observed for toluene with 38% in 3 hours (Entry 2, Table 1). Afterward, the influence of the temperature in the reaction was investigated. The reaction was performed in EtOH, toluene, MeCN, and DMF under reflux conditions with the Catalyst-specified values. The best reaction efficiency was perceived at 48% in 3 hours (Entry 11, Table 1). Finally, by increasing the reaction time from 3 to 6 hours in the reflux condition, the yield of the reaction was increased up to 95% (Entry 15, Table 1). According to the results, the reaction conditions were found to be the optimal solvent and the amount of catalyst for the formation of product **3a**.

The structures of the products were deduced from their IR and ^{1}HNMR spectroscopic data. The IR spectra of the **3a** showed two strong absorptions bands at 1671 and 1732 cm^{-1} for carbonyl groups. The ^{1}HNMR spectrum of (*Z*)-**3a** or (*E*)-**3a** exhibited three singlet signals for methoxy groups at δ= 3.68 and 3.79 ppm, and the vinyl proton at δ = 6.92 ppm. Aromatic protons appear as two triplets of

doublets at δ = 6.29 and 7.49 ppm and two doublets at δ= 6.41and 7.42 ppm. It should be noted that compounds **3 (a, b, e, f, i, j)** include *E*/*Z*isomers. NMR spectroscopy was employed to distinguish between (*Z*)-**3(a, b, e, f, i, j)** and (*E*)-**3 (a, e, f, i)**. The (*Z*) and (*E*) configurations of the carbon-carbon double bonds in **3 (a, b, e, f, i, j)** are based on the chemical shift of the olefinic proton [40].The ^{1}H NMR spectra of (*Z*)-**3(a, b, e, f, i, j)** showed an olefinic proton at 6.92-8.13 ppm, while the (*E*)-**3(a, e, f, i)** isomer exhibited the olefinic proton at 6.58-6.96 ppm. In the Previous studies, we have used different nucleophiles such as triphenylphosphine, and isoquinoline. Therefore, we tried to use of new nucleophilic species for achieving these products.

Table 2. Chemical shifts of vinyl protons of **3(a, e, i)** in the presence of different catalysts.

product	δ_H produced in this work (ppm)	δ_H reported via PPh_3 catalyst (ppm)	δ_H reported via isoquinoline catalyst (ppm)
3a	E-isomer = 6.97 Z-isomer = 6.92	E-isomer = 6.30 Z-isomer = 7.06	E-isomer = 6.42 Z-isomer = 7.20
3e	E-isomer = 6.58 Z-isomer = 7.06	E-isomer = 6.54 Z-isomer = 7.05	E-isomer = 6.69 Z-isomer =7.20
3i	E-isomer = 6.96 Z-isomer = 7.16	-	E-isomer = 6.41 Z-isomer = 7.19

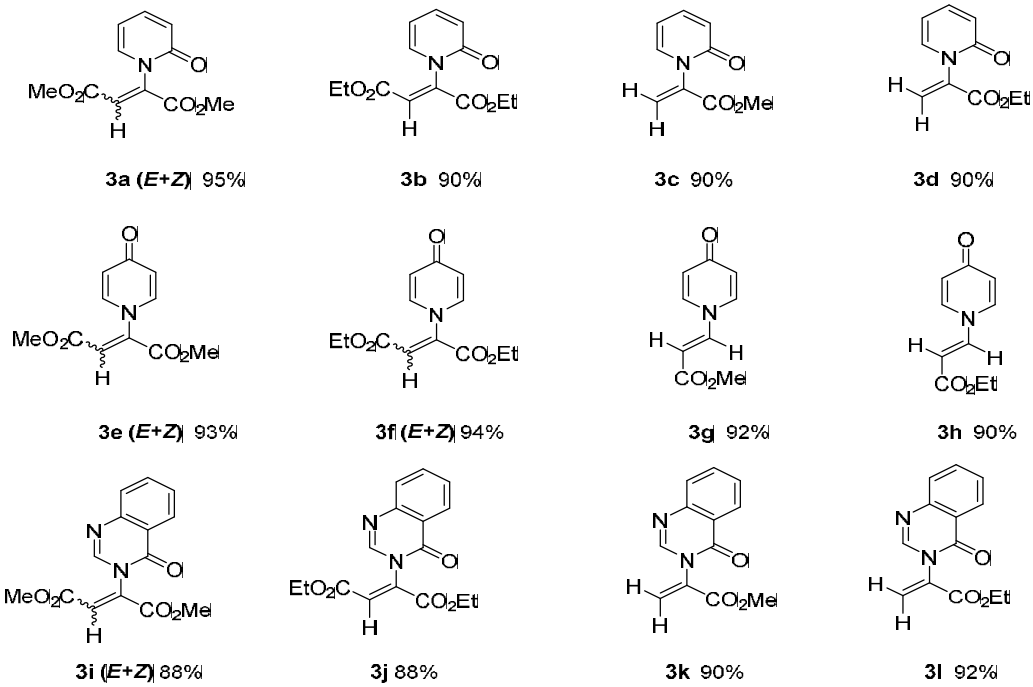
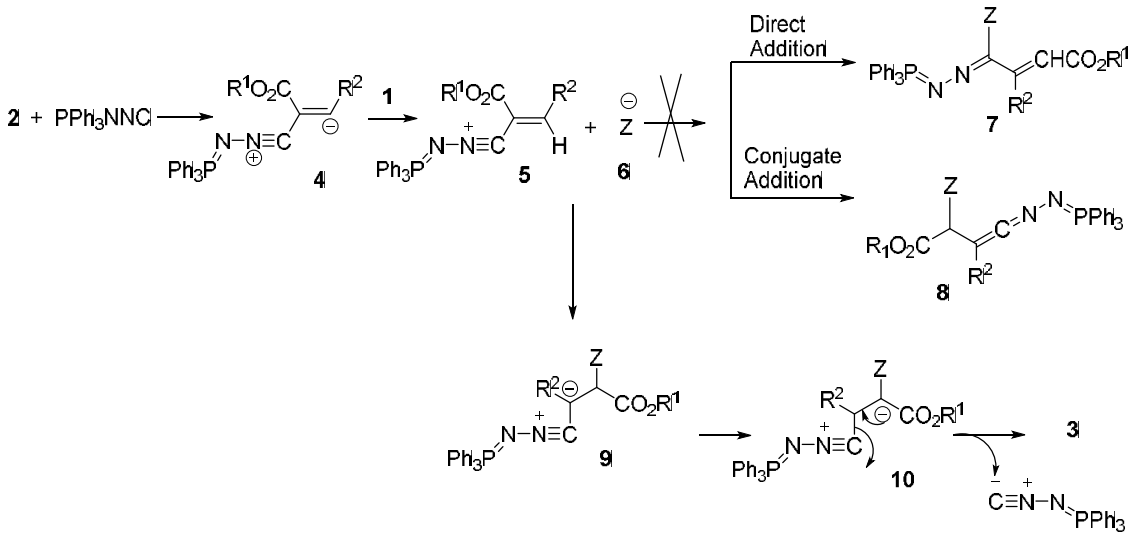


Figure 2. Synthesis of compounds **3a-l.**

In this study, *N*-isocyaniminotriphenyl phosphorane was used as a nucleophilic catalyst. Finally, similar products were synthesized by using Ph_3PNNC and we found a new function of *N*-isocyaniminotriphenyl phosphorane in the organic synthesis. In the following, the chemical shift of vinyl proton of **3(a, e, i)** due to the reaction of N-H acids with DMAD in the presence of different catalysts are compared (Table 2). All the synthesized products are shown in Figure 2.

The initial prediction of the mechanism was based on the ion-pair intermediate obtained from the reaction of *N*-isocyaniminotriphenyl phosphorane and acetylenic esters, which is protonated by compound **1.** Then, the conjugate base **6** is formed to react through two pathways (Scheme 2). Due to the ^{1}HNMR spectrum of the products, there is no trace of PPh_3NNC was observed. Eventually, A logical mechanism for this reaction is depicted in Scheme 2. According to the chemistry of isocyanide [41], it is reasonable to assume that the first step included the nucleophilic addition of *N*-isocyaniminotriphenyl phosphorane to acetylenic ester **2**, to the formation of a zwitterionic intermediate **4**. The intermediate is then protonated by NH acid **1** to afford **5**. Subsequently, it can be attacked by the N-atom of the conjugate base **6** to afford the structure **9**. This intermediate undergoes a proton transfer to furnish the 1,3-diionic structure **10**, which is converted to the final product via the elimination of *N*-isocyaniminotriphenyl phosphorane (Scheme 2). Accordingly, this reaction was performed under the same condition for 4-Hydroxy pyridine and 4-Hydroxy quinazoline.



Scheme 2.A proposed mechanism for the formation of products **3a-l.**

Conclusion

As a result, the reported method offers a simple and efficient route for the preparation of heterocyclic acrylate from the reaction between N-H heterocyclic compounds and different acetylenic esters in the presence of *N*-isocyaniminotriphenyl phosphorane. So far, PPh_3NNC has been used to form the 1,3,4-oxadiazole ring, but we have reported a new function of this compound. As part of our research on the development of a new synthesis method in heterocyclic chemistry, this is the first use of the *N*-isocyaniminotriphenyl phosphorane in organic synthesis as a catalyst for the synthesis of reported acrylates. The experimental procedure conveniently avoids the tedious work-up procedure for the isolation of the products. This method offers advantages such as high yields, short time, and mild reaction conditions making it a useful procedure concerning the previous synthetic methodologies.

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