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Potassium1, 2, 3, 6-Tetrahydrophthalimide Catalyzed Multi-Component Reaction for Efficient Synthesis of 4-arylmethylidene-3-substituted-isoxazol-5(4H)-ones as Potential Pesticides

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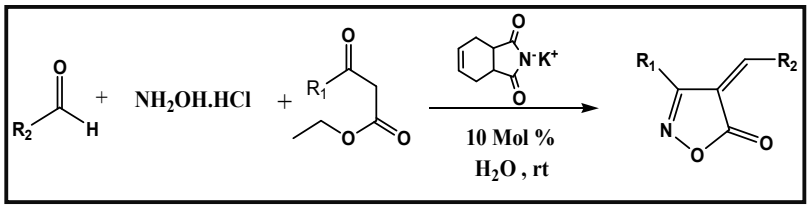
ABSTRACT

A series of 4-arylmethylidene-3-substituted-isoxazol-5(4H)-ones were synthesized by efficient, operationally improved method via one-pot three-component reaction between various aromatic aldehydes, hydroxylamine hydrochloride, ethyl 3-oxobutanoate/ethyl 3-oxo-3-phenylpropanoate in good yields. This one-pot three component reaction was performed in Potassium1,2,3,6-Tetrahydrophthalimide (PTHP) as an organocatalyst in water at room temperature. The advantages of this methodology is good yields easy workup simple reaction condition, easily available organocatalyst, relatively shorter reaction time, efficiency of reaction , easily synthesized catalyst, and environmentally benign water solvent.

Graphical Abstract

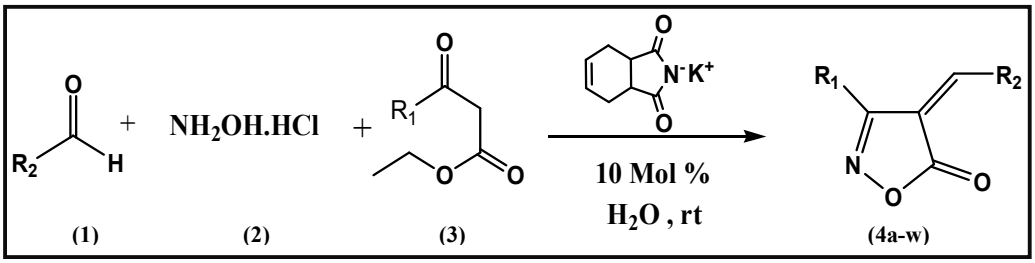


Keywords: Potassium 1,2,3,6-Tetrahydrophthalimide (PTHP), Hydroxylamine hydrochloride, Water, Potential Pesticides, Organocatalyst.

INTRODUCTION

Multicomponent reactions has great importance in organic synthesis, economic viability and no need to isolation of reaction intermediate. This process has a number of advantages compared to other reactions short reaction time, simple handling, less energy consumption, efficiency of reaction and atom economy [1-5]. On the other hand more important feather of Multicomponent reactions is that it avoids the side product and completed in less steps, easy work-up with high yields of products [6-8]. The aqueous media in Organic synthesis have much more advantage because of its, low volatility, non

hazardous, non-flammable, nontoxic, desired reactivity of reactions. Water is the easy available, available, least toxic solvent in the world. Organic synthesis using water as solvent is eco-friendly reaction condition and using water solvent is a part of green reaction process [9-10]. Due to wide variety of application in industrial and pharmaceutical area of is oxazole moiety a number of methods are developed for synthesis of this moiety in chemistry. Many studies methodologies to synthesis of this moiety, sodium sulphide [11]. Pyridine and DABCO [12], sodium citrate [13], sodium benzoate [14] sodium silicate [15], sodium tetra borate [16] and sodium Saccharin [17] etc., the derivative of oxazole's have a number of biological activities and constitutes is a privileged structure of many pharmaceutical drugs, pesticides, and wide interest in the field of medicinal chemistry. It has shown numerous activities such as anti-inflammatory [18] antibacterial [19] antidepressant [20], anticancer [21], protein-tyrosine phosphatase inhibitory [22] HDAC inhibitory [23], antifungal [24], antitumor [25], antioxidant [26], antiviral [27] anti mycobacterial [28], treatment of leishmaniosis [29] patients of active arthritis [30] COX-2 inhibitors [31], analgesic [32], nematicidal [33], anti-tuberculosis [34] antinociceptive [35], Antiviral [36], anti-HIV [37] and ulcerogenic [38], agent. For above valuable applications our group reported the synthesis of 4-arylmethylidene-3-substituted-isoxazol-5(4H)-one derivatives catalyzed by Potassium 1,2,3,6-Tetrahydrophthalimide in aqueous media at room temperature.



Scheme 1.

Where, R_2 = Substituted aromatic aldehydes at different positions
R_1 = CH_3- and C_6H_5-

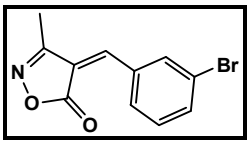
MATERIALS AND METHODS

All reagents used were purchased from commercial sources Sigma Aldrich and Avera Chemicals Pvt. Ltd. and used without any addition purification. All the synthesized products are known and their physical data is compared with already known compounds and conformed. IR spectra were recorded on a Shimadzu FT-IR using the KBr pellets method. ^{1}H NMR and ^{13}C NMR were recorded in using DMSO as a solvent at ambient temperature on a BRUKER AVANCE DRX at 400 and MHz. Melting points were determined in apparatus using an open glass capillary and are uncorrected. The reaction progresses were monitored by (TLC) thin layer chromatography using pre-coated plates.

General procedure for the synthesis of 4-arylmethylidene-3-substituted-isoxazol-5(4H)-ones (4a-w): An equimolar mixture of hydroxylamine hydrochloride (1mmol), ethyl 3-oxobutanoate/ ethyl 3-oxo-3-phenylpropanoate (1 mmol), aromatic aldehydes, (1 mmol) and (PTHP) Potassium1,2, 3,6-Tetrahydrophthalimide (10 mol %) in 5 mL of distilled H_2O the reaction mixture was stirred at room temperature to appropriate time until solid precipitate was formed. The precipitate formed was isolated washed with cold water (5 mL), filtered dried in air and collected the desired product in high yields. The solid product formed was recrystallized from hot ethanol. The filtrate was also collected and catalyst recovered by evaporating water and used to further continuous to synthesis of other derivatives, the completion of reaction was monitored with TLC.

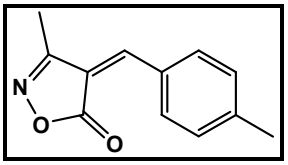
Structure of Synthesized compounds and their Physical and Spectral analysis

[4a] 4-(3-bromobenzylidene)-3-methylisoxazol-5(4H)-one:



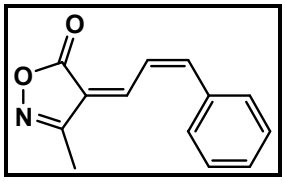
Yields 93%, Yellow crystal, mp 142-144°C, IR (KBr, cm^{-1}) 1735, 1560, 1230,1123, 890, 770,^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm): d 2.33 (s, 3H), 7.34 (s, 1H), 7.43 (t, J = 8.1 Hz, 1H), 7.73 (d, J = 7.80Hz, 1H), 8.32 (d, J = 7.8 Hz, 1H), 8.44 (s, 1H); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): d 11.58,120.90, 122.86, 130.44, 131.80, 133.87, 136.07, 136.59, 147.73, 160.84, 167.55.

[4b] 4-(4-methylbenzylidene)-3-methylisoxazol-5(4H)-one:



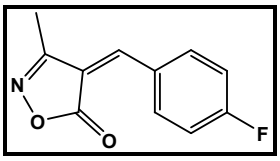
Yields 91%, Lemon crystal, mp 130-132°C, IR (KBr, cm^{-1}) 1733, 1590, 1118, 878, 775; ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm) 2.31 (s, 3H), 2.44 (s, 3H), 7.31 (d, J = 7.8 Hz, 2H), 7.41 (s, 1H), 8.26(d, J = 7.8 Hz, 2H); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): d 11.55,22.09), 118.39, 129.76, 134.19, 145.78, 149.92), 161.28, 168.24.

[4c] 3-methyl-4-(3-phenylallylidene) isoxazol-5(4H)-one:



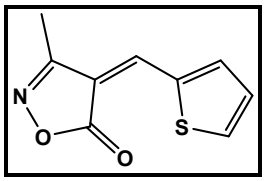
Yields 80%, Yellow crystal, m.p. 179-181°C, IR (KBr, cm^{-1}) 1734, 1546, 1101, 983, 850, 751; ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm) 2.28 (s, 3H), 7.26-7.34 (m, 2H), 7.35-7.48(m, (2H) & (1H)), 7.65-7,68 (m, 2H), 8.27-8.34 (m, 1H); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 11.18 , 117.85, 121.36 , 123.00 , 129.38, 131.45, 134.90, 147.58, 151.45 , 160.00, 168.88.

[4d] 4-(4-fluorobenzylidene)-3-methylisoxazol-5(4H)-one:



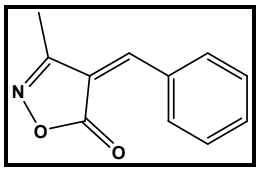
Yields 89%, Yellow crystals, m.p. 153–155°C, IR (KBr, cm^{-1}): 1750, 1618, 1588, 879, 776; ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm) 2.25(3H, *s*) 6.78 (2H, *d*, *J* = 8.1 Hz), 8.10 (1H, *s*), 8.78 (2H, *d*, *J* = 8.1 Hz); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 12.05, 116.76, 120.00, 128.90, 137.10, 148.15, 160.75, 161.45, and 168.50.

[4e] 3-methyl-4-((thiophen-2-yl) methylene) isoxazol-5(4H)-one:



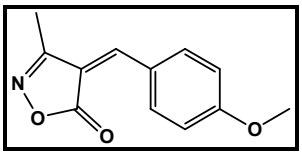
Yields 85%, Yellow-brown crystals, m.p. 149–151°C, IR (KBr, cm^{-1}): 1745, 1620, 1420, 1148, 830; ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm) 2.33 (3H, *s*),7.28 (1H, *dd*, *J* = 4.9 & 3.9 Hz); 7.60 (*s*, 1H), 7.95 (*d*, *J* = 5 Hz, 1H), 8.10 (*d*, *J* = 8.5Hz, 1H); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 11.70, 115.10, 129.30, 136.70, 140.00, 140.05, 141.90, 161.20, and 168.90.

[4f] 4-benzylidene-3-methylisoxazol-5(4H)-one:



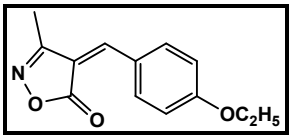
Yields 85%, Brown solid, m.p. 142–144°C, IR (KBr, cm^{-1}): 1730, 1625, 1115,1210, 875, 765, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm) 2.32 (s, 3H), 7.40 (s, 1H), 7.45-7.90 (m, 3H), 8.33 (dd, J=1.3, 7.4Hz, 2H); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 11.65, 119.80, 129.15, 130.28, 132.45, 134.10, 149.86, 161.18, 167.95.

[4g] 4-(4-methoxybenzylidene)-3-methylisoxazol-5(4H)-one:



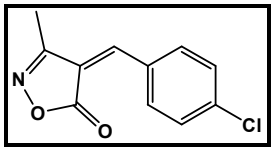
Yields 93%, Dark yellow solid, m.p. 176–178°C, IR (KBr, cm^{-1}):1735, 1580, 1268, 1019, 885, 779, 1H-NMR (400 MHz, DMSO-d6, (δ ppm) 2.31 (s, 3H), 3.89 (s, 3H), 7.30 (s, 1H), 7.05 (d, J=8.7 Hz, 2H), 8.46 (d, J=8.7 Hz, 2H); 13C-NMR (101MHz,DMSO-d6,δppm): 11.56,55.65,114.76, 116.38, 125.75, 136.93, 149.31, 161.43, 164.00 and 167.70.

[4h] 4-(4-Ethoxybenzylidene)-3-methyl-isoxazol-5(4H)-one:



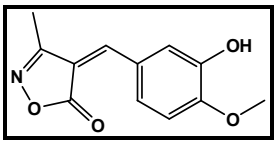
Yields 91%,Yellowish solid, m.p. 150–152°C, IR (KBr, cm^{-1}): 1735, 1575, 1560, 1510, 1425, 890, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm) 2.34(t, J = 7.2 Hz), 2.25 (s, 3H), 4.18(q, J = 7.2 Hz, 2H), 6.68 (d, J = 8.6 Hz, 2H), 7.33 (s, 1H), 8.45 (d, J = 8.6 Hz, 2H); ^{13}C-NMR (101MHz, DMSO-d6, δppm):14.85, 22.18, 64.7, 118.2, 129.8, 129.9, 134.2, 145.81, 150.29, 161.46 and 168.55.

[4i] 4-(4-chlorobenzylidene)-3-methylisoxazol-5(4H)-one:



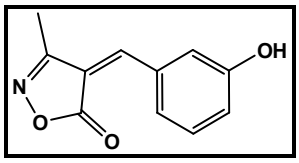
Yields 90%, Orange –yellow Solid, m.p. 129-131°C, IR (KBr, cm^{-1}) 1735, 1560, 1230, 1123, 890, 770, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm): 2.32(s, 3H), 7.36 (d, 1H), 7.37(t, 1H), 7.45 (d, 1H), 7.50 (s, 1H), 8.31 (s, 1H), 8.32(s, 1H); ^{13}C-NMR (101MHz, DMSO-d6, δppm): 11.8, 77.06, 120.10, 129.12, 129.39, 130.71, 135.10, 140.3, 140.15, 161.91, 167.85.

[4j] 3-Methyl-4-(3-hydroxy-4-methoxybenzylidene) isoxazol-5(4H)-one:



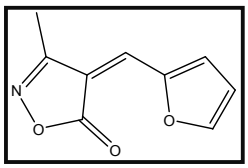
Yields 92%, Orange powder, m.p. 186-188°C, IR (KBr, cm^{-1}) 3285, 3110, 2848, 1685, 1560,1438, 1255, 1192,770 ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm)) 2.34 (s, 3H), 4.10 (s, 3H), 5.55-8.05 (s,1H), 6.91 (d, 1H, *3J* = 8.4 Hz), 7.37 (s, 1H),8.01 (d, 1H, *4J* = 2 Hz), 8.16 (d, 1H, *3J* = 8.4 Hz); ^{13}C-NMR (101MHz, DMSO-d6, δppm): 11.72, 55.92, 110.05,118.13, 120.11, 121.02, 133.04, 136.10, 144.09, 159.16, 161.05.

[4k] 4-(3-Hydroxybenzylidene)-3-methylisoxazol-5(4H)-one:



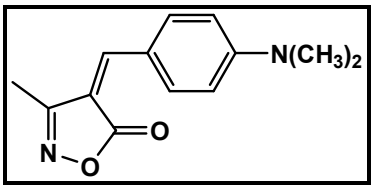
Yields 89%, Yellow solid, m.p. 214-216°C, IR (KBr, cm^{-1}) 1735, 1560, 1230, 1123, 890, 770, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm): 2.30 (s, 3H), 7.05 (d, *J* = 8.0 Hz, 1H), 7.37 (t, *J* = 8.0 Hz, 1H), 7.75 (d, *J* = 7.6 Hz,1H), 7.80 (s, 1H), 7.91 (s, 1H), 9.94 (s,1H); ^{13}C-NMR(101MHz, DMSO-d6, δppm):11.72, 118.94, 120.00, 121.81, 125.80, 130.24, 134.15, 152.34, 157.80, 162.65, 168.20.

[4l] 4-(Furan-2-ylmethylene)-3-methylisoxazol-5(4H)-one:



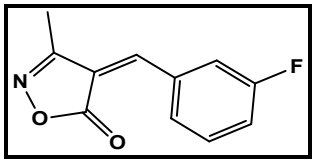
Yields 85%, Yellow solid, 228-230°C, IR (KBr, cm^{-1}) 3466, 2216, 1854,1570, 1392, 1239, 1220, 771, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm); 2.32 (s, 3H), 7.29 (t, J = 8.48 Hz,1H), 7.60 (s, 1H), 7.96 (d, J = 8.81 Hz,1H), 8.18(d, J = 8.64 Hz, 1H); ^{13}C NMR(101MHz, DMSO-d6 (δppm): 11.63, 115.65, 127.10, 128.93, 131.20, 138.88,142.05, 162.50, 169.10.

[4m] 4-(4-(dimethyl amino) benzylidene)-3-methylisoxazol-5(4H)-one:



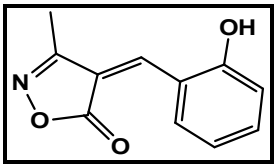
Yields 94%, Red crystal, m.p. 206-208°C, IR (KBr cm^{-1}); 1716, 1550, 1377, 1188, 1085, 875, 765, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm): 2.25 (s, 3H), 3.18 (s, 6H), 6.75 (d, J = 9 Hz, 2H), 7.20 (s, 1H), 8.36 (d, J = 9 Hz, 2H); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 11.65, 40.12, 110.90, 111.90, 122.00, 135.85, 149.70, 154.40, 161.45, 170.30.

[4n] 4-(3-Fluorobenzylidene)-3-methyl-isoxazol-5(4H)-one:



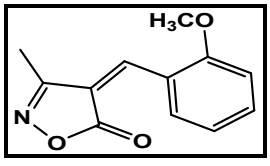
Yields 90%, Pale yellow, m.p. 141–143°C, IR (KBr cm^{-1}); 1735, 1685, 1590, 1527, 1420, 1255, 876, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm): 2.34 (s, 3H), 7.14 (m, 1H), 7.31 (t, J = 7.6 Hz, 1H), 7.58 (m, 1H), 7.35 (s, 1H), 9.05 (m, 1H); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 22.10, 110.93, 113.97, 122.22, 125.05, 132.00, 137.87, 150.09, 162.21, 165.05, 170.55.

[4o] 4-(2-Hydroxybenzylidene)-3-methylisoxazol-5(4H)-one:



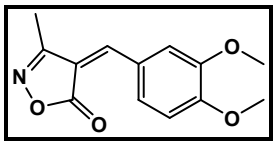
Yields 93%, Yellow solid, m.p. 199–201°C, IR (KBr cm^{-1}): 3225, 3079, 1752, 1594, 1570, 1454, 1360, 1318, 1260, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm): 2.28 (s, 3H), 6.82 (t, J=6.7 Hz, 1H), 7.06 (t, J=6.7 Hz, 1H), 7.43 (d, J=7.2 Hz, 1H), 8.10 (s, 1H), 8.72(d, J=7.2 Hz, 1H); 10.95 (s, 1H);); ^{13}C-NMR);(101 MHz, DMSO-d6, δ ppm):11.62, 110.72, 118.25, 121.00, 121.70, 133.45, 136.29, 143.90, 159.01, 161.58

[4p] 4-(2-methoxybenzylidene)-3-methylisoxazol-5(4H)-one.



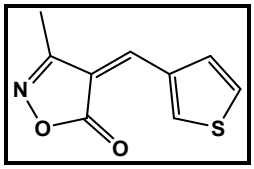
Yields 92%, Yellow crystal, m.p. 158-160°C, IR (KBr cm^{-1}): 1734, 1596, 1250, 1105, 877, 762, ^{1}H-NMR(400 MHz, DMSO-d6, (δ ppm):2.33 (s, 3H), 3.90 (s, 3H), 6.95 (d, J = 8.4 Hz, 1H), 7.04 (t, J = 7.8 Hz, 1H), 7.52 (t, J = 7.05 Hz, 1H), 8.08 (s, 1H), 8.91 (d, J = 8.1 Hz, 1Hr); ^{13}C-NMR);(101 MHz, DMSO-d6, δ ppm):11.62, 55.52, 110.72, 118.25, 121.00, 121.70, 133.45, 136.29, 143.90, 159.01, 161.58.

[4q] 4-(3, 4-Dimethoxybenzylidene)-3-methylisoxazol-5-(4H)-one:



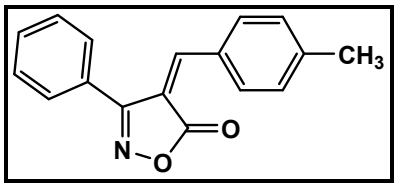
Yields 95%, Yellow needle like crystal;, m.p.134-136°C, IR (KBr cm^{-1}): 2943, 2838, 1730, 1586, 1557, 1531, 1434, 1372, 1335, 1283, 1218, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm): 2.32 (s, 3H), 4.05 (s, 6H), 6.94 (d, J = 8.2 Hz, 1H), 7.35 (s, 1H), 7.62 (dd, J = 8.2 Hz, 1.8 Hz, 1H), 8.73 (d, J = 1.8 Hz, 1H); ^{13}C-NMR); (101MHz,DMSO-d6,δppm): 21.00, 56.00, 110.90, 115.20, 119.50, 125.50, 128.50, 149.80, 164.55.

[4r] 3-Methyl-4-(thiophen-3-ylmethylene) isoxazol-5(4H)-one:



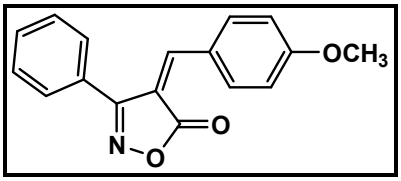
Yields 86%, Lemon yellow, mp 141-142°C, IR (KBr, cm^{-1}):1745, 1620, 1420, 1148, 830, ^{1}H-NMR (400 MHz, DMSO-d6, (δ ppm) 2.30 (s, 3H), 7.43 (dd, J = 5.2, 2.8 Hz, 1H), 7.45 (s, 1H), 7.96 (dd, J=1.6, 4.8 Hz, 1H), 9.01(dd, J=0.8, 2.8 Hz, 1H); 13-NMR (101 MHz, DMSO-d6, δ ppm):11.62, 1170.0, 126.83, 131.54, 135.62, 139.45, 141.00, 161.32, 168.45.

[4s] 4-(4-Methylbenzylidene)-3-phenylisoxazol-5(4H)-one.



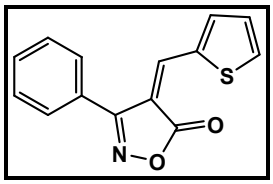
Yields 92%, Yellow crystals, mp 194–196°C, IR (KBr, cm^{-1}) 3145, 1765 1660, 1602, 1550, 1084, 930, ^{1}HNMR (400 MHz, DMSO-d6, (δ ppm): 2.45 (3H, s); 7.37(2H, d, J = 8.2 Hz); 7.51-7.658 (6H, m), 8.24 (2H, d, J 8.2Hz, aromatic); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 22.53 ,115.50, 130.10, 132.25, 128.55, 130.15, 130.50, 131.45, 135.75, 147.46, 154.20, 164.55 and 168.08.

[4t] 4-(4-Methoxybenzylidene)-3-phenylisoxazol-5(4H)-one:



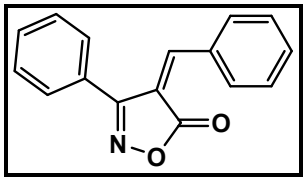
Yields 94%, Yellow Crystals, m.p. 166–168°C, IR (KBr, cm^{-1}): 3145, 1745, 1660, 1602, 1550, 1200, 930, ^{1}H-NMR (400MHz, DMSO-d6, δ ppm): 3.95 (3H, s); 7.02(2H, d, J = 8.9 Hz); 7.52 (1H, s, 7.75–7.60 (5H, m), 8.35(2H, d, J = 8.9 Hz); ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 56.10, 115.19 , 115.80, 125.90, 128.30, 130.25, 128.75, 130.95, 137.85, 152.55, 165.00, 165.25 and 170.00.

[4u] 3-phenyl-4-((thiophen-2-yl) methylene) isoxazol-5(4H)-one:



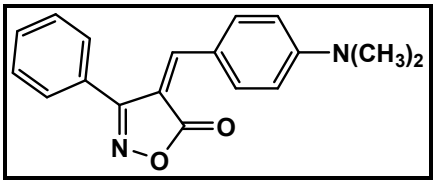
Yields 80%, Yellow crystals, m.p. 225–226°C, IR (KBr, cm^{-1}): 1745 1660,1602,1550,1200,930, ^{1}H-NMR (400MHz, DMSO-d6, δ ppm):7.25 (1H, dd, J = 4.6 & 4.5 Hz); 7.58–7.65 (5H, m) 7.82 (1H, s); 8.05 (1H, d, J = 5 Hz) 8.12 (1H, d, J = 3.7 Hz); ^{13}C-NMR (101 MHz, DMSO-d6, δppm): 113.85, 127.90, 128.85, 129.34, 129.76, 130.90, 137.05, 140.75, 141.92, 142.55, 162.95 and 169.20.

[4v] 4-benzylidene-3-phenylisoxazol-5(4H)-one:



Yields 90%, Yellow crystals, m.p. 213-215°C, IR (KBr, cm^{-1}): 1745, 1660, 1602, 1550, 1200, 930 ^{1}HNMR (400 MHz, DMSO-d6, δ ppm): 7.28 (2H, dd, J = 7.7 & 7.5 Hz); 7.70–7.65 (7H, m), 8.35 (2H, d, J = 7.6 Hz). ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 119.35, 127.70, 129.16, 129.46, 129.72, 131.48, 132.85, 134.45, 134.64, 153.25, 164.48, and 168.40**.**

[4w] 4-(4-(dimethylamino)benzylidene)-3-phenylisoxazol-5(4H)-one:



Yields 93%, Red crystals, m.p. 196–198°C, IR (KBr, cm^{-1}): 1745 1660,1602,1550,1200,930, ^{1}H-NMR (101 MHz, DMSO-d6, δ ppm): 3.18 (6H, s,) 6.73 (2H, d, J = 9.2 Hz); 7.38 (1H, s); 7.56–7.65 (5H, m), 8.42 (2H, d, J = 8.1 Hz). ^{13}C-NMR (101 MHz, DMSO-d6, δ ppm): 40.54, 110.46, 111.85, 122.35, 129.15, 129.10, 128.46, 130.65, 138.44, 152.18, 155.00, 165.08 and 170.50.

RESULTS AND DISCUSSION

In the present work we synthesize (Reaction scheme 1) the 4-arylmethylidene-3-substituted- isoxazol-5 (4H)-ones and its derivatives (4a-w). The major criteria of our work includes commercially and easily available starting materials and its condensation in water solvent and sufficient basic Potassium 1,2,3,6-Tetrahydrophthalimide (PTHP). The reactions avoid side products and give high yields of desired products (4a-w).

APPLICATION

The operationally improved methodology is mainly focusing at organocatalyzed synthesis of a series of 4-arylmethylidene-3-substituted-isoxazol-5(4H)-ones as potential pesticide and other medicinal purpose. There action catalyzed by Potassium1,2,3,6-Tetrahydrophthalimide (PTHP) as sustainable,

easily available, recyclable, reusable in further in reaction as organocatalyst and water as green, unique, eco -friendly solvent make it attractive and valuable pathway. Multi-component reactions system used in (scheme 1) synthetic procedure give different derivatives of 4-arylmethylidene-3-substituted-isoxazol-5(4H)-ones as final products in single step process without isolation and purification of reaction intermediates. Finally, this valuable the method was scaled by mild basic condition, high efficiency, simple reaction processes, easy work-up, non-hazardous, very low waste, better yield and environment-friendly reaction conditions make this research work prevalence in organic synthesis.

CONCLUSIONS

An efficient organocatalyst Potassium 1,2,3,6-Tetrahydrophthalimide (PTHP) has been developed in aqueous medium water as solvent for synthesis of 4-arylmethylidene-3-substituted-isoxazol-5(4H)-ones and its derivatives *via multi component reaction system* between various aromatic aldehydes, hydroxylamine hydrochloride, ethyl 3-oxobutanoate ethyl 3-oxo-3-phenyl propanoate room at temperature. This operationally simple and easily handballed protocols provides advantage to mild conditions, better yields easy work-up, recyclable organocatalyst, nonhazardous reaction condition shorter reaction time, easily available materials, ecofriendly water as an aqueous media make valuable series of synthesis of 4-arylmethylidene-3-substituted-isoxazol-5(4H)-ones as potential pesticides.

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