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**Synthesis of novel spiro pyrazolo-1, 4-dihydropyridine via one pot four component reaction**

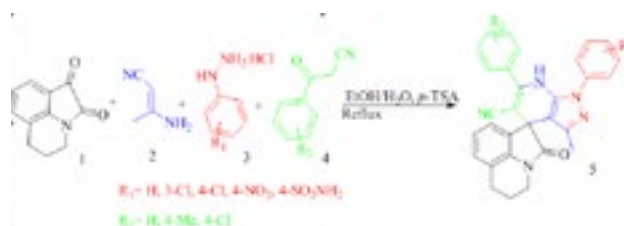
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**G**reen synthesis of spiro pyrazolo-1,4-dihydropyridine has been reported via one pot four component reaction in EtOH/H<sub>2</sub>O (1:9) in the presence of p-TSA as catalyst.

Spirooxindoles are classified as an important structural motifs due to their distribution in diverse natural products, biologically and pharmaceutical activities such as the influenza virus [1], as inhibitors of the denque virus [2] and anti-cancer agents [3]. Therefore, we conducted a series of examination the chemistry of 5,6-dihydro-4H-pyrrolo[3,2,1-ij]quinolone-1,2-dione, in which the reactivity of the ketone carbonyl group of the 2-keto-amide unit was utilized. Thus, we were able to construct various spiro[3,3'-oxindoles] via three and four component combination [4-6]. Amongst, Spiropyrazole-1,4-dihydropyridine moieties have shown important biological and medicinal activities.

As a part of our ongoing interest in this context, we reported a simple and facile synthesis of a new type of spiro pyrazolo-1,4-dihydropyridines (5) in the presence of p-TSA as catalyst (scheme 1) from starting materials phenyl hydrazine hydrochloride derivatives (3), 3-aminobut-2-enenitrile (2), 3-oxo-3-phenyl propanitrile (4) and

5,6-dihydro-1H-pyrrolo[3,2,1-ij]quinolone 1,2(4H)-dione (1) in environmentally friendly solvent, EtOH/H<sub>2</sub>O.



**Scheme: 1**

The key features confirming the structures can be illustrated with the data for product (5). The IR spectrum showed absorptions at 3207 (NH), 2190 (CN), and 1678 (C=O) cm<sup>-1</sup>. The <sup>1</sup>H NMR spectrum exhibited a singlet for the methyl group at δ 1.50 ppm and the much more acidic NH (conjugated through the double bond to the nitrile) produced a signal at δ 10.43 ppm. In the <sup>13</sup>C NMR spectrum of product (5) (with 25 distinct resonances) the carbonyl and nitrile carbons appeared at δ 175.01, 118.7 ppm, respectively.

**Biography**

Bahman Ebrahimi Saatloo received his B.Sc in Applied Chemistry (2007) from the Urmia University. He will receive his Ph.D degree in Organic Chemistry from the Urmia University (Iran) in 2018 after completing his research in the Study of Synthesis of Polyazadodecahedrone and Synthesis of Spirooxindole Compounds of 1,2,3,4- Tetrahydroquinoline by Base , Acid and Nano Catalysts under the guidance of Professor Mohammad Mehdi baradarani. His current research interest focus on the synthesis of Spirooxindole and supramolecular in heterocyclic for organic synthesis.

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