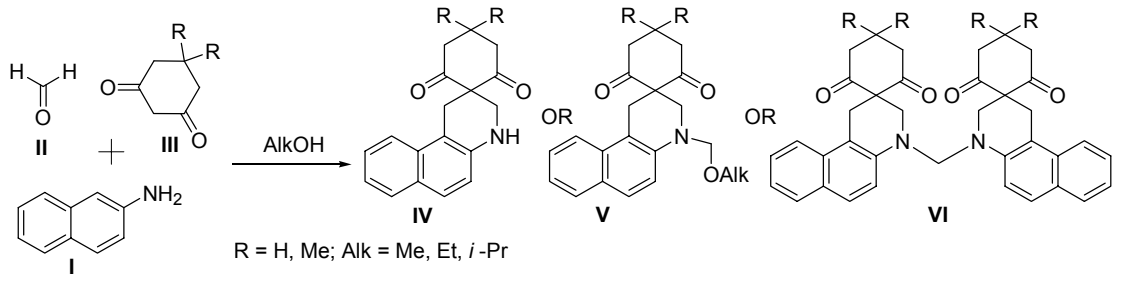
One-pot Synthesis of Novel Spirocyclic Benzo(f)quinolines

Alexey P. Kadutski[1], Nikolay G. Kozlov[1], Alexey V. Tkachev[2]

[1] *Institute of Physical Organic Chemistry of The National Academy of Sciences of Belarus*
13 Surganava Street, Minsk 220072, Belarus
e-mail: kadutskiy@tut.by
[2] *Novosibirsk Institute of Organic Chemistry, 9 Lavrentjev Ave. Novosibirsk 630090, Russia*
e-mail: atkachev@nioch.nsc.ru

In the course of our study concerning interaction between *in situ* generated Schiff's bases and cyclic β-dicarbonyl compounds we have studied three component condensation of 2-naphthylamine (I), formaldehyde (II) and cyclic β-diketones (III) such as cyclohexanedione-1,3 (III, R=H) and dimedone (III, R=CH_3).

It has been found that the reaction in aliphatic alcohol media in 1 : >3 : 1 molar ratio at room temperature for 24 h resulted in formation of unexpected spirocyclic 1,2,3,4-tetrahydrobenzo[f]quinoline derivatives (IV) or products of their further chemical transformations such as (V) and (VI). Structure of the products depends on nature of solvent and diketone. All of the spirobenzo(f)quinolines (IV-VI) were isolated in high yields (more than 70 % usually). The structures of the substances were confirmed by NMR, IR and MS data.



Some other cyclic β-dicarbonyl compounds (e.g. 2,2-dimethyl-4,6-dioxocyclohexanecarboxylic acid methyl ester, 6-methylpyran-2,4-dione, 5-phenylcyclohexane-1,3-dione) were also allowed to the condensation to give similar spiro products with additional functionality.

Also we are going to discuss synthetic and applied aspects for the all above-mentioned compounds. Some mechanistic considerations will be presented too.