

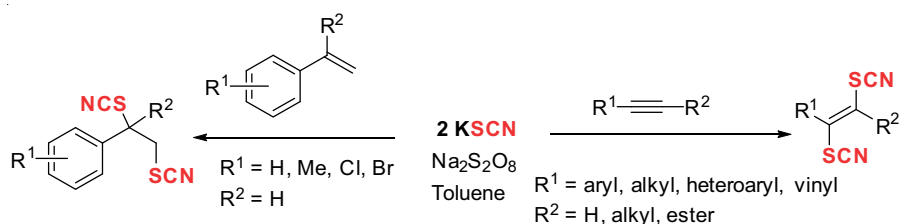
DR-24. MILD, EFFICIENT AND METAL-FREE RADICAL 1,2-DITHIOCYANATION OF ALKYNES AND ALKENES AT ROOM TEMPERATURE

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Organic thiocyanates usually serve as the synthetic precursors that can be conveniently converted into various sulfur-containing derivatives [1]. These compounds are useful precursors for the synthesis of thiols, sulfides, disulfides, thioesters, thiocarbamates, and sulfur heterocycles. On the other hand, thiocyanates are the building blocks of many heterocyclic compounds that show a wide range of biological activities and also consist in many natural products [2]. Therefore, efficient incorporation of the thiocyano group into organic molecules has drawn much attention. So an efficient transition metal-free method has been developed for the 1,2-dithiocyanation of alkynes [3 in presence of sodium persulfate and potassium thiocyanate reagent combination in a short reaction time under ambient air (Scheme) [4].



The present protocol is also applicable to styrene [5, 6] derivatives. Monothiocyanated vinyl derivatives were also synthesized from 2-ethynylpyridine and dimethyl acetylenedicarboxylate. Experimental results suggest that the reactions proceed through the radical pathway.

References

1. Zhang Z., Liebeskind L. S. Palladium-catalyzed, copper(I)-mediated coupling of boronic acids and benzylthiocyanate. A cyanide-free cyanation of boronic acids // *Org. Lett.* American Chemical Society. 2006. Vol. 8, № 19. P. 4331–4333.
2. DNA damage by fascicularin / S. Dutta [et al.] // *J. Am. Chem. Soc.* American Chemical Society. 2005. Vol. 127, № 43. P. 15004–15005.
3. (Dichloriodo)benzene and lead (II) thiocyanate as an efficient reagent combination for stereoselective 1,2-dithiocyanation of alkynes / O. Prakash [et al.] // *Tetrahedron Lett.* Pergamon. 2001. Vol. 42, № 4. P. 553–555.
4. Mild, Efficient, and Metal-Free Radical 1,2-Dithiocyanation of Alkynes and Alkenes at Room Temperature / S. Samanta [et al.] // *ACS Omega.* American Chemical Society. 2018. Vol. 3, № 10. P. 13081–13088.
5. Hypervalent iodine chemistry: Novel and direct thiocyanation of alkenes using [bis(acetoxy)iodo]benzene/trimethylsilyl isothiocyanate reagent combination. Synthesis of 1,2-dithiocyanates / M. Bruno [et al.] // *Tetrahedron Lett.* Pergamon. 1998. Vol. 39, № 22. P. 3847–3848.
6. Copper-catalyzed efficient dithiocyanation of styrenes: Synthesis of dithiocyanates / Y. Lv [et al.] // *Synth. Commun.* 2016. Vol. 46, № 14. P. 1223–1229.