



GREEN SYNTHESIS OF PHOSPHOROTHIOTES

B. Kaboudin, F. Farjadian

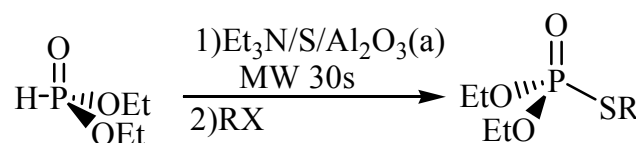
Department of Chemistry, Institute for Advanced Studies in Basic Sciences, Gava Zang, Zanjan

45195-1159, Iran

fatemehfarjadian@gmail.com

Organophosphorus compounds have found a wide range of application in the areas of industrial, agricultural, and medicinal chemistry owing to their biological and physical properties as well as their utility as synthetic intermediate [1]. Among the phosphate esters, phosphorothioate derivatives are of interest since their wide range of pharmacological activity, industrial and synthetic applications, but their synthesis has received little attention.

Surface-mediated solid phase reactions are of growing interest [2] because of their ease of set up and work-up, mild reaction conditions, rate of the reaction, selectivity, high yields, lack of solvent and the low cost of the reactions in comparison with their homogeneous counterparts. The application of microwave energy to accelerate organic reactions is of increasing interest and offers several advantages over conventional techniques [3]. Synthesis of molecules that normally require large periods, can be achieved conveniently and very rapidly in a microwave oven. As a part of our efforts to explore the utility of surface-mediated reactions for the green synthesis of organophosphorus compounds [4-6], we reported a new method for the preparation of phosphorothioates by reaction of diethyl phosphite with alkyl halides in the presence of a mixture of triethyl amine/sulfur/alumina under solvent-free conditions using microwave irradiation[19].



A simple work-up, low consumption of solvent, fast reaction rates, mild reaction conditions, good to excellent yields, relatively clean reactions with no tar formation make these methods attractive in green chemistry and a useful contribution to present methodologies for the preparation of phosphorothioates [7].



References

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