

This article was downloaded by:

On: 27 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713618290>

Synthesis and Herbicidal Activity of α -[2-(Fluoro-Substituted Phenoxy)Propionyloxy] Alkyl Phosphonates

Yan-Jun Li^a; Hong-Wu He^a

^a Key Laboratory of Pesticide and Chemical Biology of Ministry of Education, Central China Normal University, Wuhan, P. R. China

To cite this Article Li, Yan-Jun and He, Hong-Wu(2008) 'Synthesis and Herbicidal Activity of α -[2-(Fluoro-Substituted Phenoxy)Propionyloxy] Alkyl Phosphonates', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 183: 2, 712 – 713

To link to this Article: DOI: 10.1080/10426500701807566

URL: <http://dx.doi.org/10.1080/10426500701807566>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Synthesis and Herbicidal Activity of α -[2-(Fluoro-Substituted Phenoxy)Propionyloxy] Alkyl Phosphonates

Yan-Jun Li and Hong-Wu He

Key Laboratory of Pesticide and Chemical Biology of Ministry
of Education, Central China Normal University, Wuhan,
P. R. China

Eight of novel fluoro-substituted phosphonate derivatives were synthesized and the preliminary bioassay indicated that these compounds exhibited herbicidal activities.

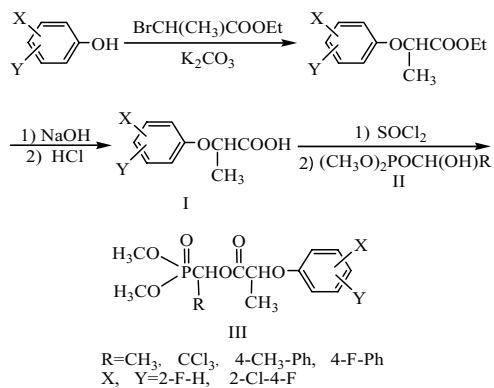
Keywords Fluoro-substituted; phosphonate; synthesis

The title compound was synthesized by the reaction of O,O-dimethyl 1-hydroxyalkylphosphonate and 2-(fluoro-substituted phenoxy) propionyl chloride according to a literature procedure.^{1,2} O,O-dimethyl 1-hydroxyalkylphosphonate could be prepared by the reaction of dimethyl phosphite and several types of aldehydes using potassium fluoride and alumina (mass ratio was 1:1) as a catalyst with a yield of 56%–88%.^{3–5} Adding triethylamine as catalyst and trap of acid, the synthesis of the title compounds could be completed with an isolated yield of 20%–70%.

All eight compounds were confirmed by ¹H NMR, IR, MS spectra and elemental analysis. The results of preliminary bioassay indicated that the title compounds exhibited significant herbicidal activities. It is worthy to note that the introduction of fluorine moiety to phosphonate's structure was useful for the improvement of herbicidal activity.

Financial support by National Basic Research Program of China (2003CB114400) and NNSF of China (20372023, 20772042).

Address correspondence to Hongwu He, Key Laboratory of Pesticide and Chemical Biology of Ministry of Education, Central China Normal University, Wuhan 430079, P. R. China. E-mail: hel208@mail.ccnu.edu.cn



REFERENCES

- [1] H. W. He, *Chin. Chem. Lett.*, **9**, 415 (1998).
- [2] H. W. He, *Chin. J. Org. Chem.*, **23**, 155 (2003).
- [3] B. J. Lewis, T. Laurent, and Tessier Jean. *EP376819*, 1990.
- [4] B. Springs and P. Healbe. *J. Org. Chem.*, **14**, 1165 (1976).
- [5] F. B. Francoise and L. Maryvonne, *Tetrahedron. Lett.*, **27**, 3515 (1986).