This article was downloaded by:

On: 28 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

A New Model of Inductive Effect in the Analysis of Organophosphorus Reactivity

Artem R. Cherkasov^a; Vladimir I. Galkin^a; Igor M. Sibgatullin^a; Rafael A. Cherkasov^a Kazan State University, Kazan, Russia

To cite this Article Cherkasov, Artem R., Galkin, Vladimir I., Sibgatullin, Igor M. and Cherkasov, Rafael A.(1996) 'A New Model of Inductive Effect in the Analysis of Organophosphorus Reactivity', Phosphorus, Sulfur, and Silicon and the Related Elements, 111: 1, 141

To link to this Article: DOI: 10.1080/10426509608054770 URL: http://dx.doi.org/10.1080/10426509608054770

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.

A NEW MODEL OF INDUCTIVE EFFECT IN THE ANALYSIS OF ORGANOPHOSPHORUS REACTIVITY

ARTEM R.CHERKASOV, VLADIMIR I.GALKIN, IGOR M.SIBGATULLIN, AND RAFAEL A.CHERKASOV

Kazan State University, Kazan, Russia

Structure and reactivity correlation is one of the most important problems of modern organic and organoelement chemistry.

We have suggested a new model of inductive effect, which allows to calculate the inductive constant of any substituent at any reaction center on the basis of fundamental physical laws and enough simple mathematical apparatus. Experimental calculated constants in Taft's inductive scale for a wide series organic, organoelement and charged substituents form with each other a correlation of high quality:

$$\sigma^*$$
 (theor.) = (0.031 ± 0.012) + (0.993 ± 0.006) σ^* (exper.)
N = 427, S = 0.190, R = 0.9910

The model suggested allows to calculate easily the inductive constants of any substituents phosphorus and any other heteroatom and may be very useful in analysis of organoelement (and organophosphorus in particular) reactivity. Besides theoretical results obtained, show that in common case the inductive effect in organoelement chemistry is non-linear with that in organic chemistry - that is why carbon inductive constants may be used in organoelement reactivity correlations with a great caution.

The work is realized with financial support of the S.- Petersburg Competition Center.