

This article was downloaded by:

On: 29 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>

## Metallochlorophosphates-Perspective Binders for Heat Resistive Compositions

M. I. Kuzmenkov<sup>a</sup>; T. E. Goldar<sup>a</sup>; S. M. Kirov<sup>a</sup>

<sup>a</sup> Belorussian Technological Institute, Minsk, USSR

**To cite this Article** Kuzmenkov, M. I. , Goldar, T. E. and Kirov, S. M.(1990) 'Metallochlorophosphates-Perspective Binders for Heat Resistive Compositions', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 51: 1, 483

**To link to this Article:** DOI: 10.1080/10426509008041007

**URL:** <http://dx.doi.org/10.1080/10426509008041007>

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.

## METALLOCHLOROPHOSPHATES - PERSPECTIVE BINDERS FOR HEAT RESISTIVE COMPOSITIONS

M.I.KUZMENKOV and T.E.GOLDAR

S.M.Kirov Byelorussian Technological Institute, Sverdlov Str. 13<sup>a</sup>, Minsk 220630, USSR

New ways of synthesizing aluminium, magnesium and chromium phosphate binders with phosphorous metal ratio of 1:1 were discovered. It was found that the viscous solution of metallochlorophosphate binders and powdered chlorophosphate aluminium, magnesium and chromium can be used as a component for heat resistive materials. Viscous binders increase the mechanical strength, while powdered chlorophosphates ensure safe storage, usage and transportation. Investigation of formation conditions, constituent, physico-chemical properties and thermal treatment of liquid binders and precipitated from it aluminium, chromium and magnesium chlorophosphate showed the presence of  $MHPO_4 \cdot nH_2O$  where M - Al, Cr and  $MgH_2PO_4Cl \cdot nH_2O$  where  $n = 2-6$ . It was found that similar compounds are formed by the reaction of metallic chloride with phosphoric acid and metallic hydroxide, the mixture of phosphoric and hydrochloric acids having  $M:P:Cl = 1:1:1.1-1.8$  ratio. The latter method is more technological. It was stated that the viscosity, density and stability of liquid chlorophosphate binders depend on the nature of cations: viscosity increases, while density decreases from Cr-Mg-Al, precrystallization period increases from 1 to 3 days for magnesium up to 3-5 months for aluminium, and a year for chromium. As a result of thermal treatment metallic orthophosphate without water of crystallization is produced. Highly effective heat resistive materials with compressive strength of 70-106 MPa, refractoriness 1300-1800°C and hardening temperature of 150-350°C are developed.