

ICPC 2012

Rotterdam, The Netherlands

19th International Conference on Phosphorus Chemistry

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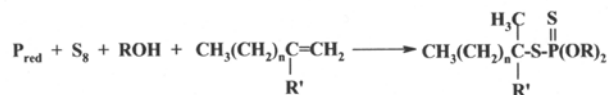
Novel Effectively Carbonaceous and Sulfurated Hydrogen Corrosion Inhibitors on the Basis of Organothiophosphorus Compounds

Sinyashin, O.G.¹; Batyeva, E.S.¹; Ugryumov, O.V.²; Nizamov, I.S.²; Varnavskaya, O.A.²; Vasyukov, S.I.²; Khodyrev, Y.P.¹; Platova, E.V.¹; Badeeva, E.K.¹; Kursheva, L.I.¹; Zagidullin, A.A.¹
State Budgetary-Funded Institution of Science A. E. Arbuзов Institute of Organic and Physical Chemistry of Kazan Scientific Center of Russian Academy of Sciences, Arbuzov Str., 8, Kazan, Russia
JSC "Niineftpromchim", Yershov st., 29, Kazan, Russia.

Novel ammonium salts of O,O-dialkyl dithiophosphoric acids were obtained by one-pot synthesis from white phosphorus, elemental sulfur, industrial alcohols and amines. The ammonium salts of O,O-dialkyl dithiophosphoric acids prepared have been found to be effectively carbonaceous (protective effect 90-99%) and sulfurated hydrogen corrosion inhibitors (protective effect 88-89%) toward steel hand-made goods. In the case of carbonaceous corrosion, no dependence of inhibitory effect from alkoxy group size and amine character is observed. On the other hand, protective effect from sulfurated hydrogen corrosion depends upon alcohol and amine characters. It is noteworthy that in the case of carbonaceous corrosion protective effect of these compounds is increased at the evaluated temperatures (30-80°C). Thus, the substantial interest in ammonium salts of O,O-dialkyl dithiophosphoric acids is due to their potential use in crude petroleum recovery in large depth.



In continuation of our approach, we have manage to involve red phosphorus in the reactions with elemental sulfur, alcohols and the cheap industrial fractions of C₁₆-C₁₈ and C₂₀-C₂₆ of higher α-olefins in the presence of Lewis acid catalyst (ZnCl₂) to form long chain S-alkyl esters of O,O-dialkyl dithiophosphoric acids.



R = Pr-i, Bu-i, Octyl-i; R' = H, n = 13, 15, 18-23; R' = Me, n = 12, 14, 16-20

We have also shown that long chain S-alkyl O,O-dialkyldithiophosphonates possess the high anticorrosion activities toward mild steel (protective effect 91.8%) in the condition of aggressive carbonaceous medium.

Acknowledgement

The study was performed with financial support of the Russian Foundation for Basic Researches (Grants No. 09-03-00006-a and 12-03-00479-a).