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## Phosphorus, Sulfur, and Silicon and the Related Elements

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## INFLUENCE OF IODINE ON REACTIVITY OF PHOSPHORUS SULFIDES AND HOMOLOGUES OF DAVY'S REAGENT IN ORGANIC REACTIONS

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**Abstract** The use of iodine results in reactivity enhancement of phosphorus sulfides and homologues of Davy's reagent in the reactions with disulfides, amins and thioacetals. The reactions  $\beta$ -diiodotetra-phosphorus trisulfides with disulfides, amins and thioacetals were studied.

### INTRODUCTION

Phosphorus sulfides and  $(RSPS_2)_2$  react with dialkyl disulfides, amins and thioacetals under severe conditions (100-200°C) with the formation of some novel organothio-phosphorus compounds.

### RESULTS AND DISCUSSION

The application of iodine in the reactions of  $P_4S_3$ ,  $P_4S_5$ ,  $P_4S_7$ ,  $P_4S_{10}$  and  $(RSPS_2)_2$  with dialkyl disulfides leads to a significant improvement in yields of trialkyl tetrathiophosphates at 20-60°C. These reactions proceed via the intermediate formation of S,S'-dialkyl S'',S''-alkyltetrathiolothionophosphates. The products of (1-dialkylamino)- and (1-alkylthio)alkyl thionophosphonate structure were obtained in the reactions of  $P_4S_3$ ,  $P_4S_5$  and  $P_4S_7$  with amins and thioacetals in the presence of iodine at 20°C. The reaction of  $P_4S_{10}$  with thioacetals which leads to (1-alkylthio)alkyl tetrathiophosphates is also facilitated when iodine is employed (20°C).