





## CONCLUSIONS

Contrary to the previously described results, the reaction of the  $\beta$ -oxoalkylidetriphenylphosphoranes with the acid chlorides of the p-nitrobenzoic, cinnamic, and phenylacetic acids gives only the acyloxyvinylphosphonium salts. As a result, all of the currently known reactions of phosphorus  $\beta$ -ketoaldehydes with acid chlorides lead to the O-acylation products.

## LITERATURE CITED

1. N. A. Nesmeyanov, S. T. Berman, P. V. Petrovskii, A. I. Lutsenko, and O. A. Reutov, *Zh. Org. Khim.*, **13**, 2467 (1977).
2. N. A. Nesmeyanov, S. T. Berman, P. V. Petrovskii, and O. A. Reutov, *Izv. Akad. Nauk SSSR, Ser. Khim.*, **1980**, 2805.
3. S. T. Gough and S. Trippett, *J. Chem. Soc.*, **1962**, 2333.
4. P. A. Chopard, J. G. Searle, and P. H. Devitt, *J. Org. Chem.*, **30**, 1015 (1965).
5. A. V. Dombrovskii, V. N. Listvan, A. A. Grigorenko, and M. I. Shevchuk, *Zh. Obshch. Khim.*, **36**, 1421 (1966).
6. M. I. Shevchuk, E. M. Volynskaya, and A. V. Dombrovskii, *Zh. Obshch. Khim.*, **40**, 48 (1970).
7. F. Ramirez and S. Dershowits, *J. Org. Chem.*, **22**, 41 (1957).

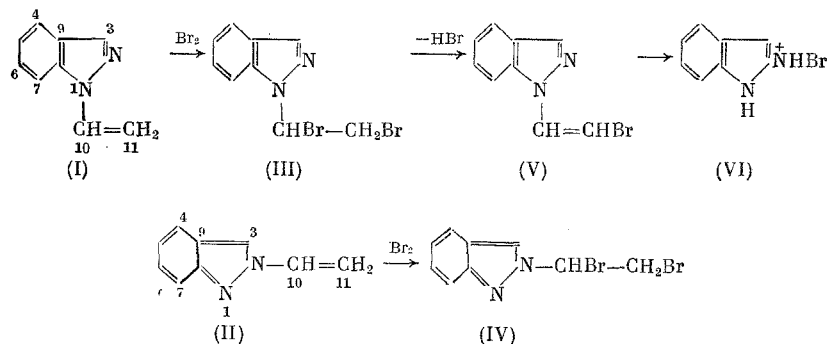
## BROMINATION OF VINYLINDAZOLES

E. S. Domnina, L. A. Es'kova,  
G. G. Skvortsova, N. N. Chipanina,  
and V. K. Voronov

UDC 542.944:546.14:547.799

The direct chlorination or bromination of indazole leads mainly to the 3,5-dihalo derivatives [1]. The reaction of bromine with the vinyl derivatives of indazole was studied in the present paper. It is known that vinylazoles react differently with halogens depending on the basicity, the number and arrangement of the nitrogen atoms in the ring, and also on the polarization of the vinyl group. Thus, the more basic vinylbenzimidazole ( $K_{AS}$  75) reacts with halogens to give complexes, while the addition of bromine or chlorine to the vinyl group is characteristic for vinylbenztriazole ( $K_{AS}$  15) [2, 3].

It was shown by us that 1-vinylindazole (I) and 2-vinylindazole (II) are brominated in  $CCl_4$  even at  $-20^\circ C$ . The PMR spectra of the reaction mixture testify that, in contrast to vinylbenzimidazole, the initial and main direction of the reaction for indazoles (I) and (II) is the addition of bromine to the vinyl group to give dibromoindazoles (III) and (IV):



The structure of 1-(1',2'-dibromoethyl)indazole (III) and 2-(1',2'-dibromoethyl)indazole (IV) is proved by the downfield presence of quartets that belong to the  $CHBr$  fragments, and also of the triplets and quartets of the