



Soviet-era science, translated into English

Chemistry

Corresponding Member of the Academy of Sciences of the USSR V.
V. Korshak, A. M. Sladkov, and Yu. P. Kudryavtsev

1962

SovietRxiv

View the original and related papers at <https://sovietrxiv.org/items/ru-196201.40575>

Source: Math-Net.Ru and CyberLeninka. Machine translation. Verify with the original.

Abstract

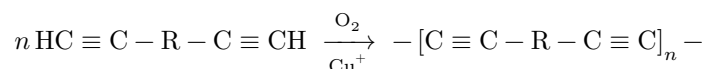
Full Text

Chemistry

Corresponding Member of the Academy of Sciences of the USSR V. V. Korshak, A. M. Sladkov, and Yu. P. Kudryavtsev

Oxidative Dehydropolycondensation of 2,6-Dimethyl-3,5-diethynylpyridine and 9,10-Diethynyl-9,10-dihydroxy-9,10-dihydroanthracene

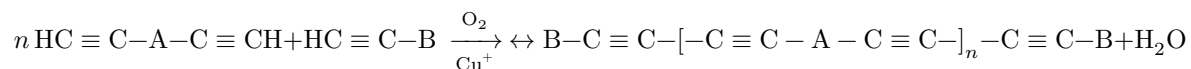
It was shown earlier that oxidative dehydropolycondensation of acetylene ⁽¹⁾ and of certain diacetylenic hydrocarbons ^(2,3) leads to the formation of high-molecular-weight products containing conjugated acetylenic bonds in the chain. The reaction follows the scheme:



The high-molecular-weight products formed by this reaction are insoluble and possess electrophysical properties anomalous for organic substances ⁽¹⁻³⁾. To obtain soluble compounds, there are apparently three possibilities, namely: carrying out the reaction in the presence of monoacetylenes that terminate the chain, with the aim of obtaining low-molecular-weight products; introducing into the molecules of the initial diacetylenic hydrocarbons bulky groups R; and introducing polar groups R.

To confirm these assumptions, we synthesized 9,10-diethynyl-9,10-dihydroxy-9,10-dihydroanthracene and 2,6-dimethyl-3,5-diethynylpyridine. The oxidative dehydropolycondensation reaction was carried out with these products and jointly with acetylene, *p*-diethynylbenzene, phenylacetylene, propargyl alcohol, and 2-methyl-5-ethynylpyridine. As a result of the reaction, in all cases both insoluble and soluble products of identical structure were obtained.

The structure of the products was established by comparison of the IR spectra of the starting products, soluble and insoluble polymers, and also on the basis of elemental analysis of the products obtained. Below is given the scheme for formation of high-molecular-weight products by the oxidative dehydropolycondensation reaction.



| No. | Product of oxidative dehydrochlorination: $HC\equiv C-C\equiv C-C\equiv C$ | Product of oxidative dehydrochlorination: $HC\equiv C-C\equiv C$ | m.p., | Found, % C | Found, % H | Found, % N | Calculated, % C | Calculated, % H | Calculated, % N |
|-----|--|---|-------|------------|------------|------------|-----------------|-----------------|-----------------|
| 2 | Same | $HC\equiv C-C\equiv C$; IR 2200; 1580; 1720 | — | 85,25 | 4,17 | — | 85,20 | 4,23 | — |
| 3 | Same | $HC\equiv C-C\equiv C$; IR 2200; 1580; 1100; 1110; 940; 830 | — | — | — | — | — | — | — |
| 4 | Same | $HC\equiv C-C\equiv C$; IR 2200; 1580; 1720; 760; 690 | — | 87,23 | 4,21 | — | 88,08 | 4,35 | — |
| 5* | 2,6-dimethyl-3,5-diethynylpyridine structure shown | IR 3300; 2200; 1100; 1000; 900; 710 | — | 45,73 | 4,70 | 8,72 | 85,24 | 5,76 | 9,02 |
| 6** | Same | $HC\equiv C-C\equiv C$; IR 2200; 1580; 1000; 900; 710; 690; 930; 690 | — | 82,18 | 4,44 | — | 86,66 | 4,44 | — |
| 7 | Same | $HC\equiv C-C\equiv C$; IR 2200; 1580; 1000; 900; 710; 690; 930; 690 | 108 | 92,27 | 4,95 | 2,47 | 91,13 | 4,95 | 3,9 |

of such bulky substituents into the acetylene chain leads to the formation of soluble products.

Institute of Organoelement Compounds
Academy of Sciences of the USSR

Received
16 I 1962

CITED LITERATURE

1. V. V. Korshak, V. I. Kasatochkin et al., DAN, **136**, 1342 (1961).
2. A. Hay, J. Org. Chem., **25**, 1275 (1960).
3. I. L. Kotlyarevskii, L. B. Fisher, E. S. Domnina, Izv. AN SSSR, OKhN, 1961, No. 10, 1905.
4. W. Ried, H. Schmidt, A. Urschel, Chem. Ber. **91**, 2472 (1958).
5. A. P. Kost, P. B. Terent'ev, T. Zavada, DAN, **130**, 326 (1960).

* The ESR spectra were recorded by N. M. Bazhin at the Institute of Chemical Physics, Academy of Sciences of the USSR.

Note: Figure translations are in progress. See original paper for figures.

Source: Math-Net.Ru and CyberLeninka. Machine translation. Verify with the original.