

We observed a similar phenomenon when phytin was boiled with 10% sulfuric acid for 6-7 h. Under these conditions, the phytin was converted quantitatively into phosphate, and a crystalline precipitate of CaSO_4 deposited from the acid solution. When the acid solution was neutralized with 25% ammonia to pH 8.0-9.0, a microcrystalline precipitate of phosphate (AgNO_3) deposited. The IR spectra of the phosphate obtained on the cooking of rice flour [1], on the drying of phytin, and on the treatment of phytin with sulfuric acid were identical. The phosphate was an organic compound of inositol with phosphoric acid.

We may note that the experimental results that we have obtained on phytin are evidence in favor of Neuberg's structure [3].

Thus, in the process of drying moist phytin at high temperatures, a considerable amount of it is lost. In order to prevent the formation of phosphate in part, the roasting of rice flour and the drying of the phytin must be carried out at a low temperature.

LITERATURE CITED

1. R. R. Akbarov, Kh. S. Mukhamedova, and S. T. Akramov, *Khim. Priir. Soedin.*, 540 (1979).
2. State Pharmacopoeia of the USSR [in Russian], 10th edn., Moscow (1968), p. 539.
3. A. M. Sobolev, *Usp. Biol. Khim.*, 4, 248 (1962).

DESTRUCTION OF LIGNIN ON PHOTOELECTROCHEMICAL REDUCTION

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UDC 541.13:543.8:547.992.3

The electrochemical reduction of lignin in nonaqueous media leads to a change in its molecular mass, the degree of degradation depending on the type of solvent and the potential of the cathode [1]. It has been shown [2, 3] that the photolysis of solution of lignin likewise leads to a degradation of the substance. Furthermore, it has been established that on irradiation the lignin fragments pass into an excited state, which causes a qualitative change in their redox properties [4].

We assumed that a combination of the methods of preparative photolysis and electrolysis could give lignin preparations with physicochemical — in particular, molecular-mass — characteristics different from those of the initial lignin.

The process of photolysis, electrolysis, and photoelectrolysis were carried out in hexametapol-methanol (67 mole-% of ethanol) saturated with LiCl for 5 h at a concentration of lignin of 0.5-5 g/liter. After the end of the process, the solution was diluted with dimethylformamide and passed through a column of Sephadex LH-20 calibrated with respect to monomers, dimers, and the polymer. The degradation of the polymer component of the lignin was calculated from the normalized gel-filtration curves of the lignins, taking the ratio of the integral absorption of the elution zone of the polymer fraction of the reduced substrate to the analogous magnitude for the initial preparation.

According to the results of gel filtration, the electrolysis of lignin at a copper cathode using a potential of -4.0 V relative to a silver comparison electrode in the solvent system mentioned led to only slight degradation of the polymeric part of the substance (12%). The photolysis of a solution of hydrolysis lignin in the system mentioned was likewise accompanied by slight cleavage (18%). In the combination of photochemical and electrochemical actions, however, the polymeric component of the molecule of the hydrolysis lignin underwent 73% degradation, i.e., the cleavage processes were not simply summed but enhanced one another. The observed effect was characteristic for various lignin preparations: nitrolignin [5] was 66% cleaved on photoelectrolysis, pine dioxane lignin was 87% cleaved, and pine soda lignin 89% cleaved (Fig. 1).

Thus, a combination of the methods of preparative photolysis and electrolysis of lignin preparations in organic solvents greatly intensifies the processes of degradation of lignin to low-molecular-weight components.

Siberian Scientific-Research Institute of Pulp and Board, Bratsk. Translated from *Khimiya Prirodnikh Soedinenii*, No. 5, pp. 663-664, September-October, 1982. Original article submitted May 10, 1982.

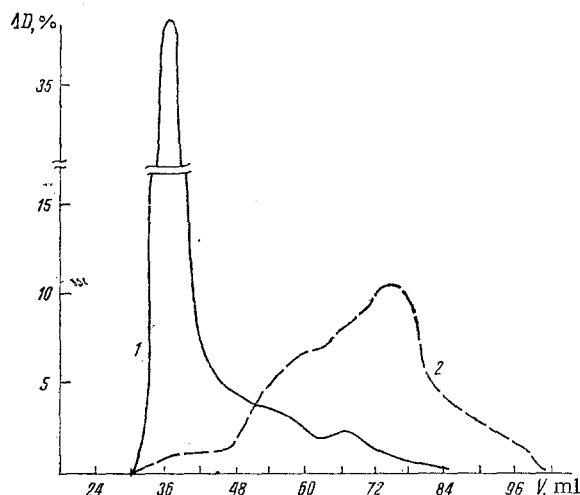


Fig. 1. Diagrams of the gel filtration of soda lignin: 1) initial; 2) reduced photoelectrochemically.

LITERATURE CITED

1. É. I. Chupka, G. I. Stromskaya, and L. V. Bronov, *Khim. Drevesiny*, **6**, 47 (1976).
2. J. Gierer and S. I. Lin, *Svensk Papperstidn.*, **75**, No. 7, 233 (1972).
3. A. D. Tupureine, É. A. Aunin'sh, and R. É. Reizín'sh, *Khim. Drevesiny*, **3**, 110 (1981).
4. É. I. Chupka and F. M. Gizetdinov, *Khim. Drevesiny*, **1**, 47 (1978).
5. A. F. Gogotov and É. I. Chupka, *Khim. Drevesiny*, **3**, 53 (1979).

ALKYL SULFATES FROM THE ASCIDIAN *Holocynthia roretzi*

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UDC 547.925:594.93

Continuing investigation in the field of sulfated derivatives from marine organisms [1], we have studied ethanolic extracts of the ascidian *Holocynthia roretzi*.

The animals were collected in May in Peter the Great Bay at a depth of 3-5 m, and were comminuted and extracted with ethanol. The extract from 70 specimens of ascidians was evaporated to dryness and treated with 1000 ml of water. The aqueous solution was separated and passed through a column filled with Teflon powder, which was washed first with water and then with ethanol. The ethanol-containing fractions were evaporated to dryness and, after chromatography on columns of silica gel [CHCl_3 -EtOH (7:1 and 2:1)] and Sephadex LH-20 [CHCl_3 -EtOH (2:1)], 1 g of a mixture of ammonium salts of alkyl sulfates was isolated in the form of an amorphous white powder with R_f 0.42 [TLC on silica gel: CHCl_3 -EtOH- H_2O (90:30:1)]; $[\alpha]_D^{25}$ 0° (H_2O).

The results of elementary analysis for C, H, N, and S corresponded to those calculated for ammonium salts of alkyl sulfates with 9 and 10 carbon atoms in the chain in a ratio of 1:1. The IR spectrum showed absorption bands at 1200 and 1415 cm^{-1} , which are characteristic for organic sulfates, and a strong broad band with a maximum at 3200 cm^{-1} , characteristic for NH_4^+ [2].

Solvolysis of the mixture of alkyl sulfates in dioxane at 100°C for 4 h [3] led to the formation of a mixture of alcohols consisting, according to GLC (Chromaton N-AW-HWDS, 5% of SE-30) of 13 components, the two main ones making up 39% and 25% of the total amount. The

Pacific Ocean Institute of Bioorganic Chemistry, Far Eastern Scientific Center, Academy of Sciences of the USSR, Vladivostok. Translated from *Khimiya Prirodnykh Soedinenii*, No. 5, pp. 664-665, September-October, 1982. Original article submitted January 20, 1982.