

MCC-25 (Univ. Zagreb)

Master of Science Thesis

Croat. Chem. Acta 38 (1966)

Effect of Alkaloids on the Fluorescence of Solutions

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It was found by fluorometric measurements that different alkaloids exert a quenching action on the fluorescence of solutions. The effect of quenching consists of three components: 1) quenching by an internal filter, 2) quenching by the anions and 3) quenching by the cations of alkaloids. On the ground of measurements of the absorption of light and the intensity of fluorescence as well as by mathematical analysis, these components were separated from one another.

The half concentrations of the »true« quenching by the cations of alkaloids were thus determined, as well as the constants of quenching according to the hyperbolic and exponential equations. The phenomenon of quenching the fluorescence of different substances in solutions by alkaloids may be related with regard to its mechanism to the effect of these drugs *in vivo*.

Hydrastinine chloride shows intensive fluorescence in solutions. Cotarnine chloride, on the contrary, shows no fluorescence at all. Although there is only a slight difference in their chemical constitution. Cotarnine on the other hand has rather an efficient quenching effect on the fluorescence of hydrastinine.

The observed effects of quenching are thought to be caused by formation of molecular compounds (dimers) between the fluorescent substances and the alkaloids. Thus we are concerned with the static mechanism of quenching.

Examiners: Prof. K. Weber, Prof. S. Ašperger, and Prof. Z. Supek

Oral examination: March 12, 1966.

Thesis deposited at the University Library and Faculty of Pharmacy and Biochemistry, Zagreb.

(62 pages, 9 figures, 53 references, original in Croatian)

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1. Effect of Alkaloids on the
Fluorescence of Solutions

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Alkaloids

Cotarnine chloride

Fluorometric measurements

Hydrastinine chloride

Quenching effect

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**Physicochemical Characteristics of Bacterial Lipopolysaccharides;
Lipopolysaccharides from *Bacteria Salmonella typhi***

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Lipopolysaccharides from *bacteria Salmonella typhi*. Strains Ty 2B and 0-901, were isolated by several methods described in the literature. By measuring UV spectra, detn. of rhamnose, and by biol. testing it could be concluded that some methods yield samples of greater purity than the other methods. The best results were obtained by the isolation with trichloroacetic acid. The obtained samples contained minimal quantities of nucleic acids and proteins.

Further purification of isolated Boivin-grade materials gave samples identical in chem. (rhamnose and nitrogen content) and phys. (infrared spectra) properties previously described in the literature. Materials from the Ty 2B strain proved to be a mixt. of Vi and O antigen, whereas the materials from the 0-901 strain had properties of pure O antigen.

Pure samples were investigated by the methods of ultracentrifugation, light scattering and viscometry. All purified samples contained a »fast« and a »slow« component. After eliminating the »fast« component by centrifugation, the remaining material of a narrower, mol. wt. distribution showed average mol. wts. from 5.2×10^6 to 6.2×10^6 as determined by light scattering. The radii of gyration were about 900 Å. The strong influence of electrolytes on the functional dependence of reduced viscosities vs. concn. shows that the lipopolysaccharides behave in soln. as typical flexible coils.

Thesis is partly published: *Biochem. Biophys. Acta* 112 (1966) 589.

Examiners: Prof. B. Težak, Prof. N. Muić, and Dr. M. Herak

Oral examination: April 26, 1965

Thesis deposited at the Central Chemical Library, Zagreb, and »Andrija Stampar« School of Public Health, Zagreb.

(53 pages, 14 figures, 48 references, original in Croatian)

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MCC-26

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Light scattering
Lipopolysaccharides from *Salmonella typhi*
Lipopolysaccharides, isolation and purification of
Lipopolysaccharides physicochemical characterization of
Molecular weight
Radius of gyration
Viscometry