water molecules are not primarily adsorbed into the interior as is the case with other proteins.

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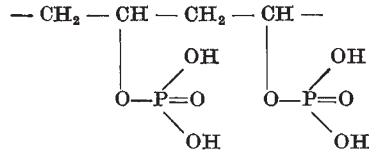
Polyvinylphosphate Contractile Systems

Riseman and Kirkwood[1] recently suggested that the relaxation of muscle may be attributed to its stretching by the electrostatic repulsion of the ionized groups carried by the phosphorylated myosin molecules. During the contraction, the phosphate groups are split off, and the macromolecules coil up by Brownian movement.

In continuation of previous researches on mechanochemical systems[2,3,4], we found that synthetic polyphosphate systems indeed exhibit a high contractility. Polyvinylphosphate, readily obtained by the phosphorylation of polyvinyl alcohol, served as a simple model for the above theory.



Fibres of high-molecular polyvinyl alcohol, 0·15 mm. thick, containing 10–15 per cent moisture, were heated, while stretched, in sealed ampoules, for 24 hr. at 160° C. The cross-linked, water-insoluble fibres were phosphorylated by phosphorus pentoxide and phosphoric acid[5], a procedure which did not cause too extensive a degradation of the polymeric fibre. The reaction was stopped when a sample of the partly phosphorylated material, removed from the phosphorylating bath and thoroughly washed with water, exhibited strong contractility in concentrated hydrochloric acid. The amount of phosphorus bound by the fibre, after twenty-four hours treatment in the phosphorylating bath, at room temperature, was found to be 12 per cent; that is, about 25 per cent of the vinyl alcohol units had reacted. The method of Sumner[6,7] was employed for the analysis of the phosphorus. After four days treatment in the phosphorylating bath, the amount of phosphorus bound by the fibre increased to 18·9 per cent, that is, about half of the vinyl alcohol units had reacted. This degree of phosphorylation very distinctly weakened the polyphosphate fibre.

At neutral *p*H the free phosphate groups are ionized and the fibre is highly swollen and elongated. When the fibre is dipped into concentrated hydrochloric acid to suppress the ionization of the phosphate groups, it contracts violently in a fraction of a second to about one-half of its length and one-third of its thickness in the swollen state. The neutralization of the charged groups, in our experiments, is, in a sense, analogous to the enzymatic splitting off of the phosphate groups in the muscle, according to the scheme postulated by Riseman and Kirkwood[1]. When the fibre is returned into distilled water, or into dilute alkali to neutralize the acidic groups, it expands rapidly to its original length; the process may be repeated many times. The speed of dilation and of contraction is many times greater than that observed in systems previously investigated.

Various systems, capable of better mechanical performance, are now being investigated.

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Salicylhydroxamic Acid as an Antitubercular Agent

SOME derivatives of salicylic acid possess antitubercular properties, the most important of such substances being the well-known *p*-aminosalicylic acid used by Lehmann[1]. Nevertheless, numerous investigations seem to indicate that most of the antitubercular compounds contain amino-groups. Hydroxamic acids can be used as reagents to introduce primary amino-groups into an aromatic nucleus, as found by Turski[2]. I have recently confirmed this[3] by using diacetyl-aceto-hydroxamic acid (O N N-triacetylhydroxylamine) as an aminating agent. Upon the assumption that this compound would combine the curative properties of some salicylic acid derivatives with those of amino-compounds, the hydroxamic acid group being in a way a potential amino-group, it seemed worth while to test the value of salicylhydroxamic acid as an antitubercular agent.

Salicylhydroxamic acid was prepared according to Jeanrenaud[4] by the action of an alkaline solution of hydroxylamine on the sodium salt of methyl salicylate in aqueous medium. Salicylhydroxamic acid prepared in this way contains a certain amount of salicylic acid, but it can be purified by crystallization from acetic acid; the melting point was 168° on slow heating and 176–178° on quick heating (Jeanrenaud gives 169°).

Because salicylhydroxamic acid is dissolved with difficulty in water, the monosodium salt of the acid was then prepared by acting with 1 mol. of sodium bicarbonate (concentrated solution in water) on 1 mol. of salicylhydroxamic acid (concentrated solution in alcohol). The combined solution was filtered and con-