magnitude of 0.1 % of the dry substance or less. Mucopolysaccharides containing galactosamine are not present in the cell nuclei of calf thymus.

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Uptake of ^{35}S-labelled Sulfate in the Heparin of a Dog Mastocytoma

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Oliver, Bloom and Mangieri [1] in 1947 found dog mast cell tumors to be very rich in heparin. The heparin content of a highly differentiated tumor was some fifty times that of the dog liver. This finding has been confirmed by Riley and co-workers [2] in 1954. In 1953 Jorpes, Odeblad and Boström [3], by means of an autoradiographic technique, observed that ^{35}S-labelled sulfate is taken up by the mast cells in the subcutaneous tissue of the rat. They could not, however, determine whether the exchange observed occurred in heparin, in any of its precursors or in chondroitin sulfuric acid.

It was therefore considered of interest to know if the sulfate groups of heparin can be labelled with ^{35}S. The large content of heparin in mast cell tumors makes them a suitable material for the study of this question. At the suggestion of Dr. B. Åberg the following experiment was therefore performed.

Experimental. To a dog suffering from a rather highly differentiated mastocytoma was given 1 mC of carrier free sodium sulfate intravenously. After 24 hours the tumor, weighing 16.7 g, was removed and frozen to —20° C. After mincing in the Latapie mill, the material was digested for three weeks with proteolytic enzymes according to the technique of Gardell [4]. After digestion the suspension was treated with several volumes of 96 % ethanol at pH 8.8. The precipitate formed was suspended in water at pH 8—9 and after centrifugation the solution was passed through an anion exchange column, Dowex 2, (Boström and Månsson [5]) in order to remove inorganic sulfate. In a control test with a mixture of heparin and radioactive sulfate it was found that the radioactivity was retained, while the heparin passed through.

The sulfate free solution was evaporated *in vacuo* to dryness and dissolved in water to a concentration of 5 %. The pH was adjusted to 7—8. Then 0.2 volumes of 20 % barium chloride were added. The precipitate was separated by centrifugation. The supernatant was precipitated by adding a third of its volume of glacial acetic acid. The precipitate weighed 3.060 mg. To the mother liquor three volumes of 96 % ethanol were added. This precipitate weighed 9.795 mg. The former precipitate should contain heparin and the latter chondroitin sulfuric acid or the heparin monosulfuric acid found by Jorpes, Werner and Åberg [6] to occur in the normal mast cells. These compounds can easily be separated by

Table 1.

	Weight in mg	Counts/min./cm² of 3 mg	I. U. of heparin / mg	
			Whole blood method	Thrombin method
Barium chloride-acetic acid precipitate	3.060	6 690	61	96
Ethanol precipitate from the mother liquor	9.795	1 750	8.5	12

means of the solubility of their barium salts (Jorpes and Gardell [7]).

The anticoagulant activity was assayed by the whole blood method of Jalling, Jorpes and Lindén [8] and by a thrombin titration method described by Quick [9]. The radioactivity was measured in a Geiger-Müller counter. The condition of infinite thickness of the preparation is not reached for the 0.1 MeV beta-radiation of ^{35}S until it has a thickness of some 30 mg/cm^2. As this condition could not be fulfilled with our preparation, we decided to measure the activities of 3 mg/cm^2. For that reason the counts of the two preparations are not quite comparable.

The amino sugar content of the two precipitates was determined according to Gardell [10]. Results in Table 1.

As is evident from the table a highly active barium salt of heparin was obtained. In accordance herewith it was found that the substance contained 13.2 % of glucosamine and 0.45 % of galactosamine. The ethanol precipitate contained 3.35 % glucosamine and 2.17 % galactosamine. It is not conceivable that anything but heparin could account for the radioactivity of the barium chloride — acetic acid precipitate. Consequently this infers that sulfuric acid groups of heparin can be labelled with ^{35}S.

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Note on the Rheology of Polyacrylonitrile Solutions

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Suspension polymers of acrylonitrile, prepared by the *azo* activator technique [1], show apparent deviations from the ordinary behaviour of *redox* (emulsion or solution) polymers that calls for further attention. As earlier pointed out [1] suspension polymers do not dissolve at room temperature in dimethyl formamide even in a very broad range of molecular weight. At said temperature redox polymers may show complete solubility, and solutions containing more than 15 % by weight of polymer can ordinarily be prepared. Even if the different end groups in the two types of polymers may be one reason for this anomaly, it seems to be an undue simplification to ascribe the effect entirely to the interaction between solvent and terminating groups. The final step in the kinetic scheme of polymerization is generally shared between chain coupling and disproportionation [2], which would mean that other end groups than those derived from the activator would be present.

Some peculiarities, connected with suspension polymerization of acrylonitrile, should be shortly emphasized. Even at low degrees of conversion the monomer droplets are converted into a porous (spongy) particle. This polymer is insoluble in its monomer, and a two-phase system is obtained, where the reaction mainly proceeds on the large interphase. The supply of monomer at the reaction centres is secured by the action of capillary forces and by diffusion. As the particle grows acrylonitrile is consumed, why the propagation rate gradually decreases. The reaction ceases asymptotically by deficit of monomer and evidently shows a fairly long step gradually retarded due to a decreasing supply of acrylonitrile. Just as in the case of polyvinyl chloride [3] an excessive branching, chain transfer and an abnormal molecular size distribution should be expected at said reaction step. If sufficient activator is present, it is permitted to ask if even a slight crosslinking takes

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