EXPERIENTIA

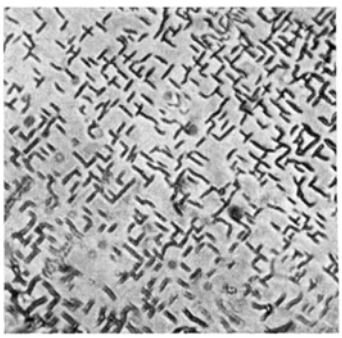
Vol. XIII - Fasc. 12 Pag. 465–504 15. XII. 1957

Brèves communications - Kurze Mitteilungen
Brevi comunicazioni - Brief Reports

Über die orientierte Aufwachsung von Polyäthylen auf Steinsalz

Über orientierte Aufwachsungen von hochpolymeren organischen Stoffen ist bisher nichts bekannt geworden.

Nachdem es in neuerer Zeit gelungen ist, einerseits Einzelkristalle von linearem Polyäthylen herzustellen[1] und andererseits Kristalle der in ihrer Kristallstruktur dem Polyäthylen sehr ähnlichen[2] niedermolekularen Paraffine zur orientierten Aufwachsung auf Alkalihalogeniden zu bringen[3], bot sich das System lineares Polyäthylen – NaCl zur Prüfung der Frage, ob hochpolymere organische Stoffe orientiert aufzuwachsen vermögen, an.



Orientierte Aufwachsung von Polyäthylen auf (001) NaCl

Versuche mit einem linearen Polyäthylen (Marlex. M = 105000) führten ohne weiteres zu den gesuchten Aufwachsungen. Das lineare Polyäthylen wurde aus einer 0,06prozentigen Lösung in Dekalin auf die Spaltfläche (001) eines auf 90° erhitzten Steinsalzkristalls aufgebracht. Das Polyäthylen orientierte sich auf (001) von NaCl in Nadeln mit der Nadellängsachse ∥ [110] und [1$\bar{1}$0].

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Krefeld, Tiergartenstrasse 21, den 12. August 1957.

Summary

Orientated overgrowth of linear polyethylene on rocksalt is described. The needle-shaped crystals of polyethylene are orientated on (100) of NaCl with the long axe of the needles parallel to [110] and [110].

[1] R. Jaccodine, Nature *176*, 305 (1955). – P. H. Till, Jr., J. Polymer Sci. *24*, 301 (1957).
[2] C. W. Bunn, Trans. Faraday Soc. *35*, 482 (1939).
[3] J. Willems, Naturwissenschaften *42*, 176 (1955).

On Chondroitin Sulphate and Mucoprotein from Cartilage

It has been proposed[1] that in mammalian hyaline cartilage chondroitin sulphate is present in two forms: about one third would be bound to a protein different from collagen to form a mucoprotein, the remainder being linked to collagen.

The present work was carried out on a product extracted from horse nasal septa cartilage. Aqueous solutions of 30% potassium chloride plus 1% potassium carbonate[2] were used in this extraction. After centrifuging, the extraction solutions were dialyzed and added with potassium acetate and alcohol at 0°C. The precipitates so obtained were redissolved and reprecipitated in a similar way and finally they were dried with absolute alcohol and ether.

The aim was to give a physicochemical picture of this product which will be referred to as MC.

The N content of MC (referred to the dry weight at 110°C) was 3·9%. Its amino acid composition, as revealed by paper chromatography, was as follows: aspartic acid, serine, glycine, glutamic acid, threonine, alanine, leucine (+++); ornithine, lysine, valine, phenylalanine (++); histidine, tyrosine, tryptophan, proline (+).

By paper electrophoresis (pH 2·0–10·0), it was found that MC was formed by two components. One was immobile and stained with light green and metachromatically with toluidine blue; the other one migrated towards the anode and only stained metachromatically with toluidine blue.

In the analytical ultracentrifuge, MC in phosphate buffer M/15, pH 7·0) exhibited a very diffuse and asymmetric boundary and it was impossible to obtain its sedimentation coefficient.

A light scattering study of MC in phosphate buffer as above made it possible to obtain the following values for the average molecular weight, dissymmetry, Z-average radius of gyration, respectively: $M_w = 1{\cdot}75{\cdot}10^6$; $z = 2{\cdot}05$; $R_z = 1100$ Å.

All the above results are easily explained if it is assumed that MC contains a certain amount of free polysaccharide besides the mucoprotein of high molecular weight. Owing to the relatively low molecular weight of chondroitin sulphate, the light scattering results must be referred to the mucoprotein. In this case too, using the

[1] J. Shatton and M. Schubert, J. biol. Chem. *211*, 565 (1954).
[2] J. Einbinder and M. Schubert, J. biol. Chem. *185*, 725 (1950).