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PROGRAMME SEQUENCE LIST

Title : Plastics. (Giant molecules)

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CU S100/13
**Tape No.** 6LT/70119
**Project No.** 00520/1113
**Date Recorded** 29.10.70

**Form** VTR



1st TX 4.4.71.

Producer: Nat Taylor

| Seq. | Time | Footage | Sequence List | Sound Cue |
|---|---|---|---|---|
| 1 | 51" | | Pentz introduces the unit. | then Prof. Haynes |
| | | | Haynes introduces polymers which he divides into two groups: 1. addition polymers, and 2. condensation polymers. | The modern chemical----- |
| | 1'53" | | Haynes discusses addition polymers with the aid of a molecular model. | |
| 2 | 2'26" | | Haynes briefly looks at some monomers which give rise to polymers. Their molecular structure is shown in a diagram. | |
| | 3'10" | | Haynes adds an initiator to a test tube containing dichlorostyrene (liquid). He places the test tube in a water bath at 90°C. | Here is Dr. Hill |
| | 3'43" | | Hill describes the substances which make up the initiators for addition polymerisation. Each has a very weak covalent bond. | We could have------- |
| | 4'40" | | Hill with the aid of a diagram explains how an initiator like a peroxide works. He shows that free radicals with one free electron each are formed. | |
| 3 | 7'30" | | A monomer, Carbon-Carbon, double bond molecule shown on animated diagram. The diagram shows how polymers are formed with the introduction of a free radical. A long chain polymer molecule results as there is always an unpaired electron at the end of the chain. Only introduction of another free radical will produce a stable polymer molecule. | |
| | 8'03" | | Hill briefly discusses the shape of polymer molecules. | 5000 monomer units |
| | | | | It seems to have |

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Continuation

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| 4 | 8'45" | | Haynes removes the test tube of dichlorostyrene and initiator from the bath. The dichlorostyrene has polymerised. | |
| | 10'08" | | Haynes with a string (as a model) shows what a 5000 chain polymer would look like. | you about these |
| | 12'53" | | Hill takes up condensation polymers. As an example he uses amino acids. The amide bond and a polyamide (protein) are shown on a diagram. The polyamide nylon is shown on a diagram and discussed. | Well, you've already---- |
| 5 | 14'44" | | Haynes gives a demonstration of the formation of a nylon polymer: A diamine is poured into a beaker containing a di-acid chloride. The two liquids do not mix. Nylon is polymerised at their interface. The nylon is pulled out in a long stand and wound on a coil. | forms quite readily. |
| 6 | 16'01" | | Haynes discusses the relationship between the physical properties of a polymer molecule and its chemical structure. Nylon is melted over a burner. A fibre is drawn from the molten nylon and to demonstrate its strength, a pair of scissors are suspended from it. | So far we've---- 547,8432235 |
| | 16'12" | | Haynes uses several strands of beads as analogues for nylon molecules to illustrate why nylon is so strong. | 547.8430184 |
| | 20'03" | | Haynes shows 2 varieties of propylene - stiff and soft. Then, with molecular models of each variety, he shows why the physical properties differ. | modern technical ingenuity |
| 7 | 22'14" | | Excerpts from BP chemical film "The world of PVC", showing: A manual polymerisation unit. An automated polymerisation unit. Pigmentation of plastics in the automated unit. Manufacture of plastic bags, polyurathane foam, plastic gloves, pipes, plastic sheets. | 668.49 effectively as possible |

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|---|---|---|---|---|
| 8 | | | Pentz discusses some of the uses of plastics and their advantages.<br>As examples he shows:<br>A Video tape<br>An Audio cassette<br>The home-kit microscope.<br>Pentz tells how plastics made the home kit microscope possible. | Well, I think------ |
| | 24'00" | | | 681.413 |
| | 24'19" | | Pentz briefly takes up the problem of disposal of unwanted plastic products. | of our thoughtlessness. |
| 9 | 24'33" | | Credits. | |