CHEMISTRY

Computers Aid Analyses

Computers that can process data for amino acids in a few minutes may speed up the discovery of the structure of proteins, Elisabeth Mitchell reports.

➤ COMPUTERS may speed the discovery of protein "architecture," the American Chemical Society was told in Atlantic City.

Each kind of protein is a long chain of "links" in a particular order, Dr. Margaret O. Dayhoff, National Biomedical Research Foundation, said. These "links" are called amino acids and there are about 20 different kinds.

Computers can process data for amino acid order in a few minutes, so that laboratory work may be reduced from several years to months, she said.

Complete or almost complete orders are known currently for only about five proteins of 100 or more amino acids. The 100 amino acids are mixtures of the 20 in different orders.

The ordering of the amino acids can define the exact structure of proteins, Dr. Dayhoff reported, and the variation of order from one living organism to another can reveal how the species evolved.

The computer searches for improbable groups of amino acids or single acids, which are then eliminated. Further searches and laboratory tests are then made, until the order in the chain is built up. If there is more than one possibility, the computer directs the chemist's attention to the ambiguous region so that further laboratory experiments can be made to find the unique structure.

"The ease and accuracy of the computer technique makes possible the determination of much longer proteins than is presently possible," Dr. Dayhoff said. Dr. Robert S. Ledley was coauthor of the paper.

• Science News Letter, 82:204 September 29, 1962

Chemical Reduces Smog

➤ EXPERIMENTS indicate that the smog problem can be eased or even eliminated by releasing iodine into the atmosphere.

Iodine in test samples of typical smog mixtures will either abate or prevent the formation of ozone, the usual index for smog, William F. Hamilton, Lockheed Aircraft Corporation, Burbank, Calif., told the American Chemical Society meeting in Atlantic City. Ten parts per hundred million, or less, is sufficient, he said.

He warned, however, that the toxicity of the research products of iodine and smog has not been determined.

Smog, the air contaminant formed from hydrocarbons and oxides of nitrogen, contains excessive ozone concentrations. With a simple chemical reaction, iodine plus ozone, the smog nuisance can be eased without excessive cost to the community or the individual, he said.

Iodine reacts in a sunlit smog atmosphere 55% more effectively than in purified air, Mr. Hamilton reported, due to this reaction with ozone. Eye and respiratory irritation was reduced to tolerable limits although exact figures are not known.

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Mix Antistatic in Plastic

➤ STATIC can be removed from synthetic fibers and plastics, the American Chemical Society was told.

Static causes shocks from carpets, clothes that cling, and scratchy dust on records. Mixing an antistatic agent directly into a plastic before it is molded into records or spun into textiles is the best way to solve the problem, Drs. Allan E. Sherr and E. A. Vitalis, American Cyanamid Company, told the meeting in Atlantic City.

One large record company has successfully used this approach to overcome the dust problem, and has achieved permanent "antistatic." This method is more effective than the surface treatments now commonly used, Dr. Sherr said.

The chemists also have shown that antistatic compounds can be successfully put into other plastic materials such as polyvinyl chloride resins, polyethylene, polypropylene, polystyrene and related materials, they told the meeting.

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Ancient Dyes Analyzed

➤ CHEMISTS can analyze the ancient dyes from around 135 A.D., scientists were told in Atlantic City.

Infrared spectroscopy, a method that "photographs" the inside of a chemical, is used to determine the dyes in the textiles, David H. Abrahams and Dr. Sidney M. Edelstein told the American Chemical Society meeting.

The textiles were found in caves near the Dead Sea in Israel among the remains of a group of followers of the famous Bar Kochba who fought one of the last battles of the Jews against the Romans.

The dyes extracted from these ancient textiles give exactly the same "picture" as dyes made by synthetic processes today.

This new method will be used to analyze many ancient dyed textiles that are now in museums and collections throughout the world.

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Remove Insecticide Easily

➤ INSECTICIDE residues can be separated from milk by a simple one-step procedure.

A quick "clean-up" method has been found which screens chlorinated insecticide-contaminants from milk and other food products, Dr. William A. Moats, U.S. Department of Agriculture, told the American Chemical Society meeting in Atlantic City.

The chemical Florisil, a synthetic adsorbent, and water are used to eliminate a wide variety of insecticides.

Success was found with such common insecticides as aldrin, chlordane, dieldrin, DDT, endrin heptachlor, heptachlor epoxide, lindane, methoxychlor, and toxaphene, Dr. Moats said. Residues can be removed from as much as two grams of fat in a single operation. Previous methods have required several operations and were time-consuming.

The Food and Drug Administration has established a zero tolerance on insecticides in milk and analytical methods must be developed for testing milk and removing harmful contaminants.

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