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<th>Study on electro-conductivity of plastic films</th>
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sonance spectrum of 6-O-(3-acetamido-3,6-dideoxy-α-D-glucopyranosyl)-N,N'-diacetyl-
deoxystreptamine which was prepared from mono-O-tosylated derivative via de-
 oxyiodo derivative.

The relationship between the structural and biochemical characteristics of these
aminoglycosides were discussed.

Grafting of Vinyl Monomer onto Natural Polymer

Takatoshi KURATSUJI (倉 辻 孝 俊)

The main purpose of this research is the preparation of grafted starch in the
form of latex.

A mixture of potato starch to water treated at 100°C was heated for one hour
in an autoclave at 145°C and ethyl acrylate—methyl methacrylate mixture (EA-
MMA) was added to this solution. Polymerization was carried out under nitrogen
using ceric salt as an initiator. On polymerization for two hours, over 98% con-
version was obtained. The average particle size of the latex thus prepared was
about 0.08 μ and the latex was found to be of a good storage stability.

The relation between the film forming ability of the latex and the three com-
ponents of the latex polymer was examined. The resulting latices gave continuous
films under the drying temperature of 20°C. The films were neither completely
dissolved nor remained unaffected with water, acids, alkalis and many organic
solvents, except in dimethyl sulfoxide. The extractants with hot water and with
acetone were found to be free starch and ungrafted EA-MMA copolymer, respec-
tively. The analytical data showed the existence of the graft copolymer in the
latex. The latex films were very fragile, so the mechanical properties of the
latex films were deduced from those of the paper coated with the latex.

The present study was proved successful in an attempt to prepare a latex of
modified starch having new properties which were found neither in starch nor in
EA-MMA copolymer latex.

Study on Electro-Conductivity of Plastic Films

Shintaro KUSUMI (久住 真太郎)

It is well known that cellulose acetate possesses a good electrical insulating
property and film forming nature, but it shows electro-conductivity on the addition
of inorganic salts.
The present study is mainly concerned with the investigation of the effects of inorganic salts of different concentration on electro-conductivity (surface resistance) and physical properties of films.

The films were cast on a glass plate from the solution of 15 gr of cellulose acetate in 100 ml of acetone. The thickness of these films were between 50 and 70 μ. Electro-conductivity, tensile strength, elongation and development of static electricity were measured using the films prepared from a solution of cellulose acetate and six kinds of acetone-soluble inorganic salts such as UO₂(NO₃)₂·6H₂O, KSCN, NH₄SCN, FeCl₃, Hg(NO₃)₂·½H₂O, NH₄ClO₄. The concentration of salts on the basis of cellulose acetate was from 0 to 10%.

The surface resistance showed a sharp decrease with the increase of relative humidity from 50 to 100% (R.H). This phenomenon may be expressed by an empirical formula as follows;

\[ \log \sigma = aX + b \]

where \( \sigma \) and \( X \) stand for the values of surface resistance (Ω) and relative humidity (% R.H.) respectively, while \( a \) and \( b \) are constants.

The moisture content of film was linearly related to the concentration of inorganic salts and relative humidity.

When the concentration of inorganic salts was increased, the tensile strength decreased elongation increased. Of the inorganic salts mentioned above, NH₄SCN, KSCN, FeCl₃ gave a negative effect on the tensile strength of the film compared with that of the original film. The cellulose acetate films with or without salts, cured at 100~105°C for 5 hours, were found to be stable.

**Study on Ion-Molecule Reaction by a Two-Staged Mass Spectrometer**

Yoshiaoki KUDO (工藤嘉昭)

Characteristics and mechanisms of ion-molecule reactions were investigated by a two-staged mass spectrometer specially designed for this purpose.

This mass spectrometer is composed with two Nier type mass spectrometers which are connected tandemly. Particular ions produced in the first mass spectrometer are led into a reaction chamber of the second one, where the ions are reacted with neutral molecules introduced from another inlet. The resultant ions by ion-molecule reaction are analyzed in the second mass spectrometer.

Relative reaction cross sections were obtained for the reactions between some neutral molecules and their parent ions and fragment ions produced in the ioniza-