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ESTIMATION METHOD OF LIFETIME BY THE HYDROLYSIS OF POLYMER MATERIAL

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Large quantities of polymer materials are used in electrical products. However, strength of the polymer material decreases under environmental condition, such as temperature, humidity and so on. Polybutylene terephthalate and polycarbonate are commonly used in the electrical products but hydrolyzed easily. Therefore, it is necessary to estimate the lifetime of polymer materials under customer environment. The long duration of conventional accelerated temperature and humidity stress test is a serious problem that exists. For the accelerated temperature and humidity stress test, we made a variety of conditions of temperature and humidity by use of constant temperature and humidity apparatus using unsaturated superheated steam. We measured the strength of polymer materials by bending test. The time at which the strength decreased by hydrolysis was related with water vapor pressure and calculated; this was done with the estimated time under different temperature and-humidity conditions, using Arrhenius equation. To estimate the time under customer environment becomes possible and evaluation time could be reduced.

Biography

Yuko Sawada received the B.E. degree in applied chemistry from Osaka Prefecture University in 1985, and in mechanical enginnering of Osaka University, Osaka, Japan. She was engaged in the research of the polymer materials at the Advanced Technology R&D Center, Mitsubishi Electric Corporation, Hyogo, Japan.

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