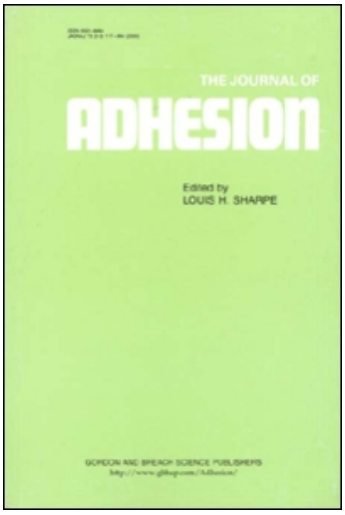

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Application of Metallized Carrier for Adhesion Bonding

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Abstract

The effects of the thickness of carrier and the curing conditions of adhesive on the electrical properties and the adhesive strength were investigated in order to apply the electroconductive carrier for adhesive bonding.

The tensile strength was smaller by increasing the thickness of carrier in the glue line and the amount of deposited metal on the carrier. In particular, the larger deterioration of adhesive strength was recognized at the room temperature setting condition than that of the heat setting condition. T-peel strength became larger with increasing the thickness of glue line, too.

On the other hand, the electrical properties were improved by increasing the amount of deposited metal on the carrier. The procedure of applying the metallized carrier for the joint decreased the leak of the electromagnetic noise from the space of that widely.

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Relation Between Surface Tension and Molecular Weight in Homologous Series

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Abstract

As Fig. 1 (in Text) shows, γ of a homologous compound increases, remains unchanged or decreases with the increase of its mol. wt. *(M)*. Why do these different types exist? Discussions about the problem were made by Imoto's equation (3).

$$\gamma = \epsilon \cdot n_s \cdot 0.25 \cdot \alpha \quad (3)$$

Here, ϵ, n_s and α are the cohesive energy per molecule, the number of molecule per cm^2 of the surface and the compensating factor, respectively.

Compound of the homologous series is expressed by e—$(r)_n$—e, where e and r indicate the end- and repeating groups. Then, the variation of the relation between n of repeating unit, that is *M*, and γ may be controlled by following two conditions.

The first condition is related with tne changes of • and n_s terms. With increase of n, ϵ increases straightly and n_s decreases curvedly. The product of $\epsilon \cdot n_s$ increases, decreases or remains unchanged. To speak generally, γ changes with the change of $\epsilon \cdot n_s$. Typical examples of the increase of γ with $\epsilon \cdot n_s$ are the homologs of alkane, dialkyl ether and *N,N*-dialkylaniline. In the cases of alkylbenzene and poly-(ethylene glycol), both $\epsilon \cdot n_s$ and γ remain unchanged.

The second condition is related with the term of $0.25 \cdot \alpha$, that is, α of Eq (3). For example, in the case of alkanol-1, $\epsilon \cdot n_s$ decreases with n, while α increases more rapidly than $\epsilon \cdot n_s$, especially in the range of smaller n. Thus, γ increases with n. The reasons of the change of α are discussed.

γ of alkylbiphenyls and alkylnaphthalenes decrease with n, while $\epsilon \cdot n_s$ of both homologs remains at constant. The reason is due to the decrease of α, whose cause is the structure of the surface.

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On the Relation between Φ and γ_{SL}

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Abstract

In adhesion, γ_{SL} and Φ are used as criterions of wetting. Good wetting is obtained, when γ_{SL} is small or Φ is large. This paper concerns with the case in which various liquids are placed on a definite solid surface. Theoretically, the relation between Φ and γ_{SL} is generally expressed by the following two equations.

Case 1: When Φ is constant,

$$\gamma_{SL}=\frac{C_1}{C_2}+\gamma_L-\frac{\Phi}{C_2}\sqrt{\gamma_L} \tag{11}$$

$$(C_1=\sqrt{\gamma_S}/2, c_2=0.5/\sqrt{\gamma_S}$$

Case 2: When Φ is not constant,

$$\phi=\frac{1}{\sqrt{\gamma_L}}(C_1+C_2\gamma_L-C_2\gamma_{SL}) \tag{8}$$

Figs. 4 and 6 in the text are the examples of the case 1 and Fig. 7 is that of the case 2.

(Received: June 14, 1990)

Reflection Threshold for Ultrasonic Waves Measured with Acoustic Microscope

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Abstract

The smallest spacing of a crack that ultrasonic waves can be reflected from is measured with an acoustic microscope.

A glass plate with convex surface is put on a flat glass plate.

Because the convex surface was prepared to have large radius of curvature, the value of spacing in the sample slightly increases along the radial direction, in which the experiment of reflection of sharp ultrasonic waves having high resolving power generated from acoustic microscope is made.

The value of spacing in which ultrasonic waves perfectly penetrate is measured to less than 450 Å and that in which ultrasonic waves partially penetrate is measured to less than 1400 Å.

(Received: July 31, 1990)

Study on the Adhesive Protein of the Pearl Oyster

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Abstract

This rapid communication deals with a marine adhesive protein secreted by the pearl oyster *Pinctada fucata* in the sea around Japan. The biological observations on foot, bysuss and disc of the pearl oyster were obtained. Amino acid compositions of the adhesive disc, thread and secreting gland were analysed. Based on the compositions, a working hypothesis to determine the primary structure of the adhesive proteins has been proposed. The strengths of adhesion on five substrates were measured. The pearl oyster escaped from the surface of Teflon. The adhesive proteins of pearl oyster may have promise as bioadhesives.

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