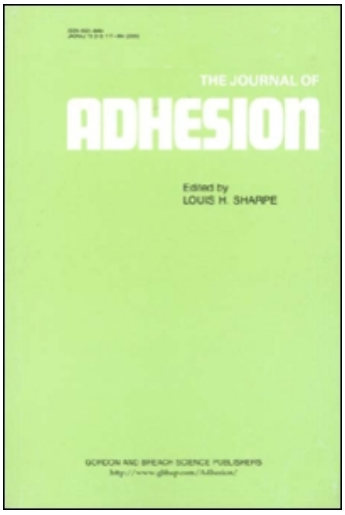

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Contents Lists and Abstracts from the Journal of the Adhesion Society of Japan

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Contents

X-ray Diffraction of Acrylate Copolymer/Fluoro-copolymer Blends

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Abstract

The blend solutions of an acrylate copolymer [poly (2-ethylhexyl acrylate-co-acrylic acid-co-vinyl acetate)] and a fluoro-copolymer [poly (vinylidene fluoride-co-hexafluoro acetone)] (in THF, blends concentration ≈ 20 wt%) were coated on release liner at 90°C for 60 sec. Then, the structure of blends were investigated with X-ray diffraction. Following results were obtained. 1) The acrylate copolymer

was observed the peak of amorphous halo on the diffraction angle $2\theta \approx 19°$, while the fluoro-copolymer was shown the crystal peaks on $2\theta \approx 18°$, 20° and 26°. 2) The diffraction ratio I_{18}/I_{20} of $2\theta \approx 18°$ and 20° for the fluoro-copolymer 0～40 wt% blends increased with increasing of the fluoro-copolymer content. In the range of 40 to 50 wt% of the fluoro-copolymer component, the diffraction ratio I_{18}/I_{20} decreased with increasing of the fluoro-copolymer content, then the diffraction ratio increased with increasing of the fluoro-copolymer content in the blends of the fluoro-copolymer component over 50 wt%. 3) The blends of the fluoro-copolymer content 40 and 50 wt% were observed the plateau region on the diffraction intensity in the range of 20 to 26° of the diffraction angle 2θ. It was suggested that blends of the acrylate copolymer and the fluoro-copolymer possessed multiphase structure by X-ray diffraction.

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Pretreatment of Insulation Resin Layer and Adhesive Property of Plated Copper

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Abstract

Recently, metal core printed wiring boards (PWB) have been expanding their application fields, because of the excellent heat dissipating and magnetic properties. However, the economic and reliable method to form conductor on the substrate, especially on the through hole wall, has not yet been developed.

This paper proposed the method to form conductor directly on the metal core insulated with epoxy resin containing NBR and $CaCO_3$.

(1) It was found that treating the resin surface with CrO_3/H_2SO_4 solution after swelling in IPA/DMF (isopropyl alcohol/dimethylformamide) is effective to obtain high peel strength of plated copper.

(2) It was also found that the peel strength decreased noticeably with the increasing temperature of swelling solution. This dependence was correlated with the thick weak layer on the resin surface formed during the pre-treatment.

(3) Electroless copper plating process with the above-mentioned pretreatment enabled us to form copper conductor directly on the metal core substrate.

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Contents

Tensile Strength of Single Lap Joint and Scarf Joint Between CFRP and Carbon Steel

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Abstract

The strength of single lap joints and scarf joints between carbon cloth laminated plastics (CFRP) and carbon steel bonded with epoxy resin was investigated both analytically and experimentally. The stress and strain distributions under tensile loads of the joints were analyzed by applying the elastic finite element method.

The strength of the joints was predicted by applying the strength law of CFRP, metal, adhesive layer and their interfaces to the calculated stress distributions. The predicted strength was compared with the experimental strength of the joints. The critical positions of the joints and the effects of the overlapped length on the joints were examined.

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Effect of Organic Modification of Silica Filler Particles on Mechanical Properties of Epoxy Resin Composites

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Abstract

Mechanical properties and thermal properties were studied on diglycidyl ether bisphenol F composites filled with synthetic silica particles modified with amino groups or epoxy groups. Though the relative modulus of epoxy composites increases with increase in the volume fraction (Φ_f) of silica particles at the temperature range below T_g, it decreases at the temperature above T_g. In the cases of composites filled with aminopropyl-modified or glycidoxy-propyl-modified silica, however, the relative modulus above T_g increased when Φ_f is as high as 0.4. In these cases T_g increases also. Both the modulus above T_g and the T_g are affected by the content of the modifying groups of silica particles.

The flexural strength and the impact strength of composites are also dependent on the content of modifying groups of silica particles at high Φ_f; 0.4.

The thermal expansion coefficient decreases with increase in the Φ_f according to the rule of mixture.

These results are discussed from the viewpoint of the effects of modifying groups on the properties of matrix and on the interaction between matrix and filler.

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