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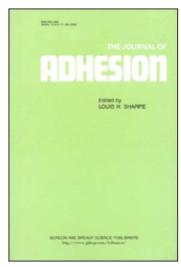
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Surface Analysis for Microwave Plasma Treated Fluororesins by ESCA

Tomoyuki Kasemura, Yoshikatu Okada and Masayuki Fujii

(Department of Applied Chemistry, Faculty of Engineering Gifu University, 1-1 Yanagido Gifu-shi 501-11 Japan)

Abstract

Three fluororesins (PDVF. PTFE and FEP) were treated with the microwave plasmas which were generated by an electronic cooking range and the surfaces of treated resins were analyzed with ESCA.

The large signal of O_{18} at 533 ev and the broad continuous spectrum of C_{18} from 295 to 285 ev appeared in the ESCA spectrums for plasma treated resins. The amount of oxygen, which was introduced by the

treatment, increased with the lowering of gas pressure in the plasma treating glass vessel. It was shown that the resin was treated more effectively by the lower treating gas pressure.

In order to obtain the depth profiles, two techniques were employed: (i) argon ion etching and (ii) by varying the electron take-off angle (θ).

- (i) The oxygen introduced by plasma treatment decreased rapidly with the going on of the ablation caused by the etching.
- (ii) For the FEP immediately after the treatment, the amount of oxygen increased with the decreasing of θ (with the shallowing of the analyzable depth) and fluorine decreased. After leaving the treated FEP in the desiccator for 70 hours, the amount of fluorine increased in the region of $15^{\circ} < \theta < 60^{\circ}$ and oxygen decreased, since the fluorine-containing segments, which had a low surface free energy, migrated to the surface of the resin.

From the depth profiles, it was found that the plasma treatment reached to a half of the depth which could be analyzed by ESCA at $\theta = 90^{\circ}$.

KEY WORDS Fluorinated polymers, Microwave plasmas, Surface Modification, Contact Angles, Wetting, Peel strength, ESCA.

An Approach to the Setting-up of an Infrared Optical System with Bonding and Sealing

Zhang Jixin

(NO. 803 Research Institute, Shanghai Space Bureau)

Abstract

This papers relates to an infrared optical system which is composed of several circular optical parts as sensing elements. By applying modern local and foreign bonding and sealing technology, the optical parts which were made of different materials with different expansion coefficients were set up, so that the imaging quality and the sealing requirements are ensured in spite of the variation of high or low temperatures. It is found that Thiokol material has the best characteristics. The technical data and performance of the S-7-1 Thiokol sealant developed by us and the operating process for bonding and sealing can fully meet the specification requirements for the infrared optical system.

KEY WORDS Infrared Optical System, Bonding Sealing, Process, Thiokol.

The Study on Adhesion of Metal to Rubber in Vulcanization

--- Protection and Application of -NCO Group in Polyisocyanate

Ma Xing fa, Wu Chongguang, Wang Zhongping, Jin Yanfon and Wen Xianglian

(Shan dong Institute of Non-metallic Materials)

Abstract

Preliminary analysis and comparison between -NCO and protected -NCO with IR and DSC are introduced, and the application of functional group terminated polyisocyanate in bonding agent of metal-to-rubber in vulcanization is also described. The results of 180 degree angle peel test are excellent.

KEY WORDS Adhesion, Metal-Rubber, Protected -NCO, Peel Test.

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Preparation and Application of Acrylic Ester Adhesive for Dry Lamination

Dai Molan, Zou Mingguo, Wang Shikun, Zhou Jiulin and Cao Zhenyu

(Research Institute of Fine Chemical, Chengdu university of Science and Technology)

Abstract

The relationship between the property of AD acrylic ester adhesive for dry lamination, the composition of monomer, the synthesis technology of acrylic copolymer and constituent of AD adhesive was investigated in this paper. The result obtained indicated that properties of AD adhesive come up to the standard of the normal polyurethane adhesive for dry lamination, some of the former are better than the latter, but the cost of AD adhesive was reduced by $20\% \sim 30\%$

KEY WORDS Adhesive, Dry lamination, Acrylic copolymer.

Study on the Latex Textile Adhesive

Zhang Renlan and Fan Chunshan

Abstract

In this paper, the vulcanizing, age-inhibiting, increasing in adhesion system and the stabilizing system of the latex textile adhesive were studied, respectively. A new composition and manufacturing process was introduced as well.

KEY WORDS Adhesive, Latex, Textile.

Application of PANa Resin Binder in Foundry Production

Ji GangChang, He Jiyun

(Northwest Institute of Light Industry) (Xi An Jiao Tong University)

Abstract

In this paper, the parameters of PANa resin suited for foundry use were researched. The comparison between this resin and some other gas hardening binders was made. It was shown by experiment results that PANa resin is a non-poisonous, gas-hardening resin binder which has great value in research and application.

KEY WORDS PANa Resin, Binder, Foundry.

Study on the Mechanism of the Adhesion Co-ordinate Bond by X-ray Photoelectron Spectroscpy

Zhai Haichao Weng Xixiang

(Armoured Corps Engineering Institute)

Abstract

In this paper, the chemical state of some elements on adhesive (epoxy) -adherend (steel or Al₂O₃) interface was investigated by X-ray photoelectron spectroscopy. The results show that the displacement, thus the adhesion co-ordinate bond, existing on the interface was proved.

KEY WORDS X-ray photoelectron spectroscopy, Bonding mechanism, Co-ordinate bond.

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