

耐熱透明性及び柔軟性を併せ持つ  
新規感光性樹脂の開発に関する研究

(九州産業大学院工) 土手本 康平・平山 智之  
Research on Development of New Photosensitive Resins with both Heat Resistant Transparency and Flexibility (<sup>1</sup>Graduate School of Engineering, Kyushu Sangyo University)  
<sup>1</sup>Kouhei Dotemoto, <sup>2</sup>Tomoyuki Hirayama

In recent years, due to the increase in the amount of information resulting from advanced information technology, signals used for communication are shifting from electricity to light, which can handle higher speeds, and optical waveguides are attracting attention. In particular, heat resistant transparency, and flexibility are required for the cladding material that coats the core. Therefore, we prepared cured films using varnishes with the following composition ratios, consisting of various epoxy resins and photoacid generators, and examined their transparency and heat resistance by heating tests, with elastic modulus of about 0.5 Gpa and elongation at break of at least 100% as benchmarks(Table 1). As a result, cured films with elastic modulus of 0.45 Gpa and elongation at break of 120.8% were obtained in a tensile test. When this film and a general-purpose epoxy film were tested at 125°C, the transmittance at 500 nm was as follows, and it was confirmed that the transmittance of this film exceeded 80% after 2000 hours (Fig. 1). We are currently developing a photosensitive resin that can withstand long-term heat tests by improving heat resistant transparency through the introduction of antioxidants.

近年、高度情報化に伴う情報量の増加から、通信に用いられる信号は、電気からより高速化に対応できる光に変わりつつあり、光導波路が注目されている。特にコアを被覆するクラッド材の要求特性としては、耐熱透明性と柔軟性が挙げられる。そこで我々は、弾性率 0.5GPa 程度かつ破断伸び 100%以上をベンチマークとして各種エポキシ樹脂、光酸発生剤からなる以下の配合比率のワニスを用いて硬化フィルムを作製し、加熱試験による耐熱透明性の検討を行った(Table 1)。結果として、引張試験にて弾性率 0.45GPa、破断伸び率 120.8%の硬化フィルムが得られた。また当フィルムと汎用的なエポキシフィルムに対し 125°Cで加熱試験を行った際、500nm での透過率の推移は以下のようになり、当フィルムでは 2000 時間経過後透過率も 80%を超えることが確認された(Fig.1)。現在、酸化防止剤の導入によって耐熱透明性を向上させ、長期の加熱試験に耐え得る感光性樹脂の開発を行っている。

Table 1 Combination ratio

カテゴリ	Eq	実施例
水添BPAエポキシ	230	25
	900	25
PEGエポキシ	135	25
脂肪族四官能脂環式エポキシ	220	25
光酸発生剤 (部数)		1
溶媒 (wt%)		12.5

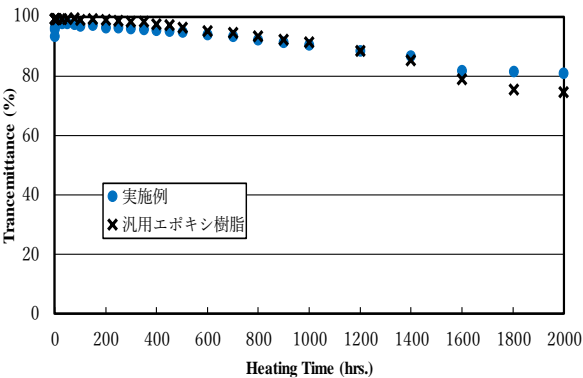


Fig. 1 Relationship between heating time and transmittance.