

次世代光インターコネクト向けの新規重水素化ポリマーの開発に関する研究

(九産大院工) ○北村篤志・平山智之

Research on the Development of Novel Deuterated Polymers for Next-Generation Optical Interconnects (*Graduate School of Engineering, Kyusyu Sangyo University*)

○Atsushi Kitamura, Tomoyuki Hirayama,

In recent years, polymer optical waveguides have attracted considerable attention as high-speed communication media in response to the rapid advancement of information technology. For reducing optical loss in polymer materials at the currently important telecommunication wavelength of 1310 nm, significant efforts have been focused on decreasing the number of C–H bonds in the molecular structure. In this study, polymers were synthesized in which C–H bonds were partially replaced with C–D bonds, and the effects of deuteration on optical properties and thermal stability were investigated. The optical propagation loss at 1310 nm and the thermal properties were systematically evaluated. As a result, a clear correlation between the degree of deuteration, optical propagation loss at 1310 nm, and thermal stability was observed, and these findings are reported herein.

近年、高度情報化が進み高速通信媒体として、ポリマー光導波路が注目されている。現在の主な通信波長帯である 1310 nm に対するポリマー材料低損失化の施策として、分子構造中 C-H 結合の低減に主眼が置かれている。そこで本研究では、C-H 結合を C-D 結合に置換することで光学特性や耐熱性への影響を確認することを目的としてポリマーを合成し、その光学特性と耐熱性を評価した。その結果、重水素化率ごとに 1310 nm 光伝搬損失と耐熱性に相関関係を見出したので報告する。

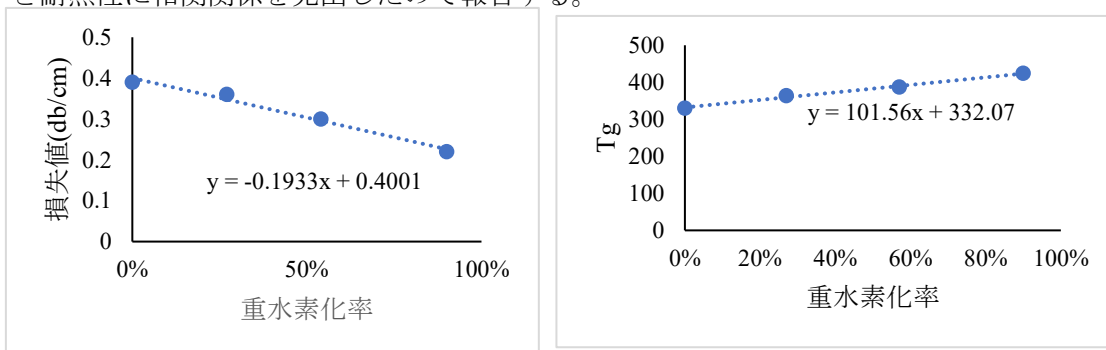


Figure 1 Propagation loss and T_g by deuterium enrichment ratio

Junya Kobayashi: Trends in polymer optical waveguide material technology. Journal of the Society of Electronics and Decorative Arts Vol.5 No.5 (2002)