2-ヒドロキシピリジル基を有する光接着モノマーの合成および特性評価

（福井高専）○古谷 昌大・笛吹 渉・西端 千遼
Synthesis and Characterization of Monomers Having a 2-Hydroxypyridyl Group for Photo-adhesion (*Department of Chemistry and Biology, National Institute of Technology, Fukui College*) ○Masahiro Furutani, Wataru Usui, Chiharu Nishibata

We have focused chemical structures that cause tautomerization reactions, to develop all-purpose adhesive materials that adhere strongly regardless of the type of adherents. In this report, we designed and synthesized photo-adhesive monomers having a 2-hydroxypyridyl group that tautomerizes between lactim and lactam isomers according to environmental conditions. Mono-functional acryl or methacryl adhesive monomers were obtained as colorless liquid in a 0.7% yield (acryl), and in a 33% yield (methacryl), using a 2-hydroxynicotinic acid as a starting compound. A photo-adhesive material was constructed with the methacryl monomer, a radical photo-initiator (8 wt%) and a little amount of solvent. In the preliminary experiments, 4.6 MPa of shear stress was recorded for a glass-glass photo-adhesive sample, which methacryloyl groups of the monomer would be consumed in the radical UV curing process (wavelength: 365 nm, 2.9 mW/cm^2, 1000 mJ/cm^2).
Keywords : 2-Hydroxypyridyl Group; Photo-adhesion; Tautomerization; Methacryloyl Group; Radical UV Curing

工業製品材料の多様化と複合化が進むなか，異種材どうしの強い接着が求められている．当研究室では互変異性化する化学構造に着目し，被着体の種類に依らず強く接着する万能型光接着材料の開発を行っている．本研究では，2-ヒドロキシピリジル基を有する光接着モノマーを設計，合成した．同官能基は，環境条件に応じてラクチムーラクタム互変異性化反応を起こすことが知られる．2-ヒドロキシニコチン酸を出発原料として合成を試みたところ，単官能のアクリルまたはメタクリル接着モノマーがいずれも無色透明液体として収率 0.7%（アクリル）および 33%（メタクリル）で得られた．このうち，メタクリルモノマーと光ラジカル開始剤（8 wt%），必要最少量の溶媒から光接着材料を調製した．予備的実験（使用波長 : 365 nm, 照度 : 2.9 mW/cm^2, 露光エネルギー，1000 mJ/cm^2）において，ガラスーガラス光接着試料を作製したところ，4.6 MPa のせん断応力を得た．