

Catechol-based Additives for Silicone Adhesives with High Adhesion

문준수, 방준하[†]

고려대학교

(joona@korea.ac.kr[†])

Inspired by the ability of shellfish to attach to rocks in water, the use of catecholic moieties is a widely used strategy for adhesives. In this study, we designed a catechol-based compound, 4-allyl pyrocatechol (APC), which contains catechol and alkene groups capable of interacting with various metal oxide substrates and being chemically incorporated into a polydimethylsiloxane (PDMS) matrix, respectively. The adhesion property was evaluated by measuring the lap shear strength on various metal substrates, such as aluminum (Al), stainless steel (SUS), and copper (Cu), and compared with that of the commercial additive, 3-glycidoxypropyltrimethoxysilane (GPTMS). Remarkably, APC-incorporated PDMS adhered to metal oxide substrates exhibited the maximum shear strength at a lower loading than GPTMS, suggesting that APC enhances the adhesion of PDMS onto metal oxide surfaces more significantly than GPTMS.