수성 폴리머 도료를 이용한 초음파 스프레이 공정으로 형성된 폴리머 절연층 미세구조 특성
Morphology Characteristics of Insulating Laser based on Aqueous Polymer Resin Fabricated by Ultrasonic Spray Coating Process

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초 록 : Commonly used oil-based polymer resin has environmental and safety issues. Many researches for replacing the harmful solvent-borne resins to water-borne resins have been investigated to purify harmful environmental resources and follow the export and import of hazardous materials regulations. In this research, ultrasonic spray coatings of aqueous polymer resin were studied to fabricate thin insulating layer (~μm) on the rectangular copper wire. It needs to have appropriate wettability between resin and substrate during the ultrasonic spray coating process to coat aqueous polymer uniformly. Furthermore, stabilities of coating solution and fabricating process are required to form thin insulating layer on the substrate. In here, physical characteristics such as viscosity of 6 types of commercial polymer dispersions and emersions were analyzed to confirm compatibility for ultrasonic spray coating process. These resins were dissolved in isopropyl alcohol, used for true solvent, and were diluted with ethanol, utilized for diluent. Also, solubilities, dispersion characteristics, and viscosities of these diluted polymer resin solutions were confirmed. Dispersion characteristic and viscosity of coating solution affects jetting of ultrasonic spray coating and these jetting characteristics influence morphologies of insulating layer. In conclusion, we have known that aqueous polymer solution should have outstanding dispersion characteristic and certain range of viscosity to fabricate thin polymer insulating layer uniformly with ultrasonic spray coating.