عنوان مقاله:

Room Temperature Cured Hydrophobic Nano-silica Coatings for Outdoor Insulators Installed on Power Lines without Shutting Down the Current

محل انتشار:

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خلاصه مقاله:

The goal of the present study is to prepare a room temperature cured hydrophobic and self-cleaning nano-coating for power line insulators. As a result, the installed insulators operating in power lines can be coated without being removed from the circuit and without the need to cut off power. For this purpose, hydrophobic silica nanoparticles were synthesized by sol-gel method using TEOS and HMDS. The synthesized hydrophobic silica nanoparticles were characterized by XRD, FTIR, SEM, and TEM analyses to investigate phase formation, particle size, and morphology. Then the surface of the insulator was cleaned and sprayed by Ultimeg binder solution, an air-dried insulating coating, as the base coating. Then the hydrophobic nano-silica powder was sprayed on the binder coated surface and left to be air-cured at room temperature. After drying the coating, the contact angle was measured to be ۱۴۹o. Pull-off test was used to check the adhesion strength of the hydrophobic coating to the base insulator. To evaluate the effect of environmental factors, UV resistance and fog-salt corrosion tests were conducted. The results showed that ۱۵۰ hours of UV radiation, equivalent to ۹ months of placing the samples in normal .conditions, did not have any significant effect on reducing the hydrophobicity of the applied coatings

کلمات کلیدی:

Hydrophobic, Self-cleaning, Room temperature curing, Coatings, Silica nanoparticles