

잉크젯 프린팅을 이용한 low-e TiO_2 -silver 투명박막형성

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Fabrication of TiO_2 -silver transparent thin films low-e coated on glass substrate by ink-jet printing

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Abstract : Low-emissivity (low-e) coatings with visible transparency have attracted increased interest in reducing heat radiation loss through window panes from ecological and sustainable aspects. TiO_2 -silver transparent thin films for low-e have good properties for UV and IR blocking as well as photocatalyst compared to that with commercial UV blocking films such as fluorine doped oxide (FTO), antimony doped tin oxide (ATO), etc. In this study, transparent TiO_2 -silver thin films were prepared by successive ink-jet printing of commercial nano silver and TiO_2 sols. The TiO_2 sol, as ink for ink-jet printing, were synthesized by hydrothermal process in the autoclave externally pressurized with N_2 gas of 200 bar at 120°C for 10 hrs. The synthesized TiO_2 sols were all formed with brookite phase and their particle size was several to 30 nm. At first nano sized silver sol was coated on glass substrate, after that TiO_2 sol was coated by ink-jet printing.

With increasing coating thickness of TiO_2 -silver multilayer by repeated ink-jet coating, the absorbance of UV region (under 400nm) and IR region (over 700nm) also increase reasonably, compared to that with commercial UV blocking films.

Key Words : TiO_2 , TiO_2 -silver, low-e, ink-jet printing