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Porous silica/polymer composite films for antireflective coatings

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Recently, the deposition of Anti Reflective (AR) coatings to improve light transmittance for substrates such as display panels, solar cells, and eyewares have attracted intense attention. We reported a simple and facile preparation of AR silica/polymer composite films comprising vesicular nanostructures by Layer-By-Layer (LbL) vesicular assemblies and subsequent silica mineralization without any post-treatments. Continuous and intact composite coatings comprising vesicular nanostructures could be prepared by specific silica deposition onto the complex vesicles in the multilayer films by amine-catalyzed polycondensation. The vesicular cavities provided an additional parameter for adjusting their optical properties. The performance of AR property were determined by film thickness and complex vesicular size. The experimental data indicated that the AR composite films coated onto substrates exhibited maximum transmission over 97% at the visible wavelength between 570 and 800 nm. In addition, the low refractive index polymeric materials can be incorporated in the AR coatings to improve light transmission, which can achieve maximum transmission over 98% in visible wavelength. Moreover, these as-prepared AR composite films were mechanically stable to withstand both the wipe and adhesion test. This study demonstrated a simple and easy method for preparing composite films comprising vesicular nanostructure by combining LbL assembly with biomineralization.

Biography

My name is Ting-Hsuan, Lin. I got bachelor degree from National Cheng Kung University (NCKU), and major in chemical engineering. Now I manage to get the master degree in the same school. My research focuses on the antireflective coatings (ARCs). Through the synthesis of different type polymer, I get excellent AR performance on any substrates by Layer-by-Layer method. Moreover, I had one paper published on ACS Applied Materials & Interfaces. From the long period of learning, I am skillful, experienced, logical, innovative, and ambitious. I hope that I can become a good engineer to solve many problems, and that my research can benefit the world.

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