Theme : Functional Materials

Subject : Anti-reflection Coating Technology

Introduction

The goal of this research project is to explore the novel anti-reflection (AR) coating technology in displays which reduce the reflection of light at the surface and improve the contrast of the images. The new AR coating technology should be cost-effective and large-area applicable with low reflection and high reliability. Currently, single or multi-layered films using vacuum deposition techniques are widely applied but suffer from cost and material limitations. Nano-patterned films (moth eye type) have been proposed and studied using nanoimprinting or plasma etching etc. but could not be easily commercialized due to the issues from surface hardness and contamination. In order to solve these problems of the current AR coating technologies, novel structures and materials are necessary.

Scope

The requested specifications for design and development of novel AR coating structures and materials are as follows:

- High transmittance, Low reflectivity (~0.1% (on glass))
- High surface hardness
- Large-area applicable
- High reliability

Research questions

Our main interests on the topic are as follows:

- What would be the most effective design structure of AR coating?
- What are the mechanisms to decrease reflectivity using the newly designed AR coating structure?
- What would be the candidate materials and methods to fabricate the newly designed AR coating structures?

Expected Deliverables

Details are negotiable.
- Suggestion of new AR structure and materials
- Detailed progress reports including accomplishments every 3 months.
- AR coating samples for testing in Samsung laboratory
- Journal publications and patents with SAIT (if agreed)