

**Fabrication of functional ZnO nano-structures for optical devices by UV nanoimprint lithography**Han-Byeol Jo<sup>\*1</sup>, Kyeong-Jae Byeon<sup>2</sup>, Heon Lee<sup>1 \*</sup>

Korea University

5-1 Anam-dong, Sungbuk-Gu, Seoul, 136-701, Republic of Korea

Recently, nanoimprint lithography (NIL) has gained great attention as an effective patterning technology in the fields of light emitting diodes (LEDs), solar cells, and other optical devices, because of its simplicity and cost effectiveness.<sup>1-8</sup> The aim of this study is the development of an imprint resin containing dispersed zinc oxide (ZnO) nano-particles that is applicable in the UV NIL process. UV NIL uses conventional monomer-based resins, which contain a UV initiator, but restrict the use of imprinted structures in optical devices due to their relatively low refractive index. In order to resolve this problem, an imprint resin containing dispersed ZnO nano-particles was prepared, using which submicron-scale structures were fabricated by the UV NIL process. The haziness of submicron-scale ZnO nano-particles resin structures and the refractive index of the ZnO nano-particles dispersion resin were measured to analyze the optical properties of the ZnO nano-particles dispersion resin and the resulting structures.

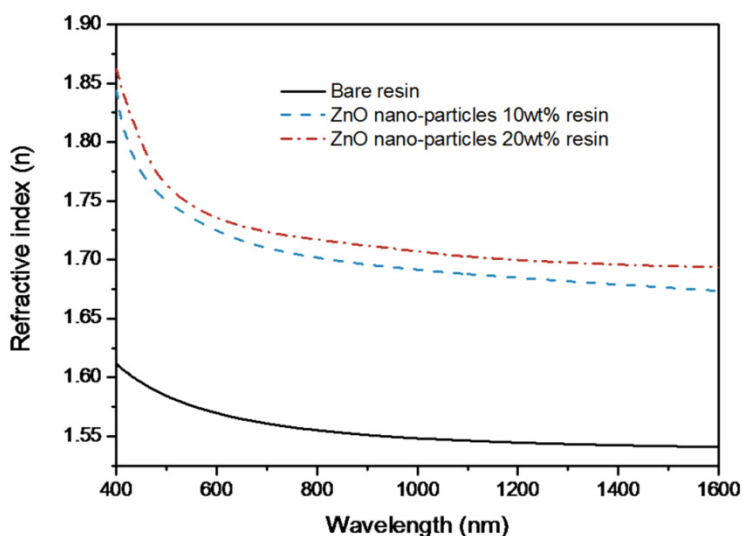


Figure 1. Refractive index of bare resin(solid), 10wt%(dash) and 20 wt%(dash dot) ZnO nano-particles dispersion resin