

## OLED광원이 집적화된 마이크로 플루이딕칩의 제작 및 특성 평가

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### Fabrication and characteristic evaluation of microfluidics chip integrated OLED for the light sources

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**Abstract :** A simplified integration process including packaging is presented, which enables the realization of the portable fluorescence detection system. A fluorescence detection microchip system consisting of an integrated PIN photodiode, an organic light emitting diode (OLED) as the light source, an interference filter, and a microchannel was developed. The on-chip fluorescence detector fabricated by poly(dimethylsiloxane) (PDMS)-based packaging had thin-film structure. A silicon-based integrated PIN photodiode combined with an optical filter removed the background noise, which was produced by an excitation source, on the same substrate. The active area of the finger-type PIN photodiode was extended to obtain a higher detection sensitivity of fluorescence. The sensitivity and the limit of detection (LOD  $S/N = 3$ ) of the system were  $0.198 \text{ nA}/\mu\text{M}$  and  $10 \mu\text{M}$ , respectively.

**Key Words :** Finger-type PIN photodiode, interference filter, microchannel, on-chip, organic light emitting diode (OLED), poly(dimethylsiloxane) (PDMS)-based packaging.