

입자침전법을 이용한 광도전체 필름의 X선 반응 특성에 관한 연구

최치원, 강상식*, 조성호*, 권철*, 남상희**

인제대학교 의료영상과학대학, 인제대학교 방사선영상연구실*, 인제대학교 의료영상연구센터**

Abstract : Flat-panel direct conversion detectors used in compound substance of semiconductor are being studied for digital x-ray imaging. Recently, such detectors are deposited by physical vapor deposition(PVD) generally. But, most of materials (HgI₂, PbI₂, TlBr, PbO) deposited by PVD have shown difficult fabrication and instability for large area x-ray imaging. Consequently, in this paper, we propose applicable potentialities for screen printing method that is coated on a substrate easily.

It is compared to electrical properties among semiconductors such as HgI₂, PbI₂, PbO, HgBrI, InI, and TlPbI₃ under investigation for direct conversion detectors. Each film detector consists of an ~25 to 35 μm thick layer of semiconductor and was coated onto the substrate. Substrates of 2cm×2cm have been used to evaluate performance of semiconductor radiation detectors. Dark current, sensitivity and physics properties were measured. Leakage current of HgI₂ as low as 9pA/mm² at the operation bias voltage of ~1V/μm was observed. Such a value is not better than PVD process, but it is easy to be fabricated in high quality for large area x-ray Imaging. Our future efforts will concentrate on optimization of growth of film thickness that is coated onto a-Si TFT array.

Key Words : X-ray Detector, Digital Radiography, Photoconductor Film, Particle in Binder Method