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Photoluminescence Characterization of Al/Al₂O₃/InP MIS Structures passivated by anodic oxidation

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Abstract: Metal-insulator-semiconductor (MIS) structures were produced by electron beam evaporation of Al₂O₃ on InP. Polyphosphate thin films of thickness 100-150 Å were used to passivate the interface InP\Insulator. Photoluminescence spectra are reported at low temperature at various stages of the realization process of the MIS-InP structure. Photoluminescence topography at ambient temperature made it possible to characterize the surface state after each technological stage. The interface degradation under the effect of repeated annealing is insignificant up to temperatures of 350 °C. Radiative major defects detected by photoluminescence spectrum with energy 0.95-1.15 eV attributed to the complexes impurities of phosphorus vacancies are substantially reduced by the presence of anodic oxide.

Key Words: Indium phosphide; MIS structures; Photoluminescence.

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