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Optimization of solar cells made of semiconductor-based element of the III-nitride.

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The element III's nitrides (GaN, AlN, InN) are wide band gap semiconductors and particularly attractive for applications in optoelectronics and microelectronics.

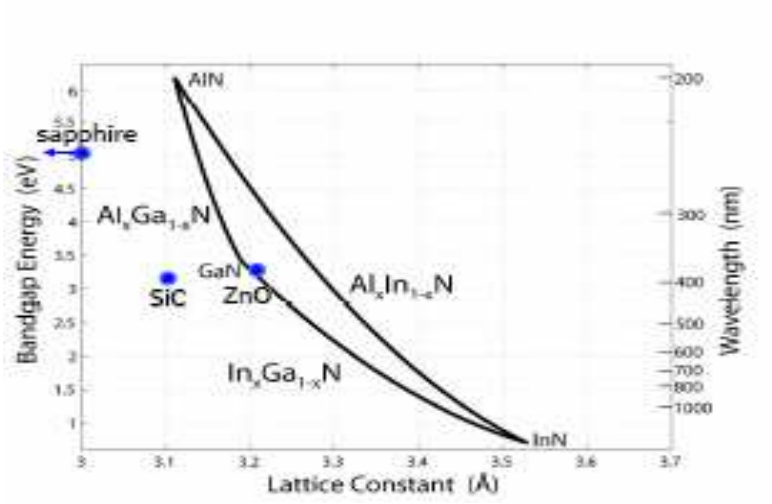
The alloys of III-V nitrides have a direct gap adjustable from 0.7 eV to 6.2 eV, resource of their use in photovoltaics. These materials are widely used for photovoltaic applications, particularly for space applications, due to their high efficiency and low degradation regarding to the space radiation.

The research in photovoltaic's field is motivated mainly by energy conversion efficiency amelioration.

Among the promising new materials in this field, the current research focuses on the ternary compounds based semiconductor element of the III-nitride such as InGaN, and InAlN.

The study emphasizes on the optimization of photovoltaic such as the photovoltaic current short circuit I_{CC}, the conversionη, the open circuit voltage V_{CO} and the form factor FF and the efficiency spectral reaction of a solar cell based on InGaN and InAlN.

The optimization of physical parameters (doping, thickness ...) various layers operated in the achievement of the cell has allowed for better performance, which may be issued by cells based on the ternary compounds.



Eg vs. Lattice Constant II: Wide Bandgap III-N