

ABSTRACT

LATTICE MATCHABLE ALLOY FOR SOLAR CELLS

An alloy composition for a subcell of a solar cell is provided that has a bandgap of at least 0.9 eV, namely, $\text{Ga}_{1-x}\text{In}_x\text{N}_y\text{As}_{1-y-z}\text{Sb}_z$ with a low antimony (Sb) content and with enhanced indium (In) content and enhanced nitrogen (N) content, achieving substantial lattice matching to GaAs and Ge substrates and providing both high short circuit currents and high open circuit voltages in GaInNAsSb subcells for multijunction solar cells. The composition ranges for $\text{Ga}_{1-x}\text{In}_x\text{N}_y\text{As}_{1-y-z}\text{Sb}_z$ are $0.07 \leq x \leq 0.18$, $0.025 \leq y \leq 0.04$ and $0.001 \leq z \leq 0.03$.

FIG. 1A