

## **ZnO/GaAs heterojunction solar cells fabricated by ALD method**

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In this work we tested the possibilities of application of an AZO electrode in GaAs based photovoltaic cells. For tests solar cells of a simple architecture were prepared.

ZnO/GaAs photovoltaic cells were fabricated by ALD (Atomic Layer Deposition) method. Thin layers of zinc oxide (ZnO) and aluminium doped zinc oxide (AZO) were deposited on p-type GaAs. We examined two types of solar cells architecture, differing in deposition sequence of the ALD layers and their function. In the first architecture, AZO was deposited on a ZnO layer. AZO plays role of a TCO (Transparent Conductive Oxide) electrode. In the second one, AZO layer was grown directly on the GaAs surface as TCO layer, but also as n-type partner in a heterojunction with a p-type GaAs. ALD processes were carried out in three different temperatures: 80, 160 and 250<sup>0</sup>C on a lightly doped p-type GaAs with three different acceptor (Zn) concentrations.

Best efficiency (Eff. = 1.39%, with a fill factor of FF=0.39) was obtained for the AZO/ZnO/GaAs cell. This efficiency can be further improved after optimization of a top metal contact (point contact was used) and of thickness of AZO and ZnO layers. Their electrical properties should also be further optimized.

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