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LASER SCRIBING OF Sb2Se3 THIN FILMS FOR PHOTOVOLTAIC APPLICATIONS

Sb_2Se_3 is a promising absorber material for photovoltaic applications due to its band-gap value (~ 1.2 eV), strong optical absorption, simple phase and composition, and earth-abundant and non-toxic constituents, reasons why Sb_2Se_3 has emerged as a potential candidate to be incorporated as high-efficiency and low-cost absorber material in thin film solar cell technology. The Sb_2Se_3 based solar cells has the possibility of its cells being interconnected in series by the laser scribing technique using 3 laser scribes steps called P1, P2 and P3 that are carried out in a sequential process by depositing each of the thin films that constitute the cell solar. In this work, the P1 and P2 laser scribes steps were implemented in the structure glass/SnO2:F/Sb_2Se_3 using a 532 nm pulsed laser. Parameters such as laser energy, pulse repetition frequency and spot overlap percentage were optimized to obtain suitable channels for the electrical interconnection of Sb_2Se_3 solar cells. The resulting laser scribes were evaluated by optical microscopy, UV-VIS spectroscopy, profilometry, composition analysis and electrical conductivity measurements, thus validating the quality of the P1 and P2 processes.

Keywords

Sb2Se3, P2 laser scribing steps, 532 nm laser, solar cells.

Reference

N/A

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Author approval

I confirm

Author will attend

I confirm

Authors: Mr RAMÍREZ AGUIRRE, Irving (Escuela Superior de Ingeniería Mecánica y Eléctrica Unidad Zacatenco. Instituto Politécnico Nacional); Ms LÓPEZ MENDOZA, Jenifer Monserrat (Escuela Superior de Ingeniería Mecánica y Eléctrica Unidad Zacatenco. Instituto Politécnico Nacional)

Co-authors: Dr JIMÉNEZ OLARTE, Daniel (Escuela Superior de Ingeniería Mecánica y Eléctrica Unidad Zacatenco. Instituto Politécnico Nacional); Dr GONZÁLEZ CASTILLO, Jesús Roberto (Escuela Superior de Ingeniería Mecánica y Eléctrica Unidad Zacatenco. Instituto Politécnico Nacional)

Presenter: Mr RAMÍREZ AGUIRRE, Irving (Escuela Superior de Ingeniería Mecánica y Eléctrica Unidad Zacatenco. Instituto Politécnico Nacional)

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