"Materials, The Building Block For The Future"

3rd AAAFM-UCLA International Conference

August 18-20, 2021

Ackerman Grand Ballroom, UCLA

Dated: March 15, 2021

Acceptance Letter

Dear Olikh, Oleg (1);
Kostylyov, Vitaliy (2);
Vlasiuk, Victor (2);
Korkishko, Roman (2),
1: Taras Shevchenko National University of Kyiv, Ukraine;
2: V. Lashkaryov Institute of Semiconductor Physic of NAS of Ukraine, Kyiv, Ukraine

Abstract Approval ID: 817

Your abstract, "**Ultrasound as Functional Influence Tool on FeB pair Association in Silicon Solar Cells***"submitted under* ***Symposium 1: Functional Materials for Energy Storage and Conversion Devices (FESC)****, submitted on: 2021-Mar-09 06:18,* presentation type**: Poster** has been accepted for presentation at the "International Conference on Advances in Functional Materials which will be held at UCLA (AAAFM-UCLA)".

For Oral Presenters: A projector and screen will be available in each meeting room, and in most rooms, a lapel microphone and podium will be provided. All technical session, presentation's scheduled time and location will be announced soon.

For Poster Presenters: Posters **must** be of **A1 size (in portrait)**. Authors should print the poster and bring it with them to the conference. The schedule for the poster presentation will be published soon on our website.

The registration is now open. Delegates can register for the conference on/before 25th March, 2021 to avail **Early Bird**, discounted rates. Make sure that you use your Abstract Approval ID (provided above) while making registration. Please visit https://aaafm.org/ucla2021/registration to complete your registration now.

Students are required to upload valid proofs online during registration to obtain discount rates.

Organizing Committee
Advances in Functional Materials Conference
AAAFM-UCLA, August,18-20, 2021
https://aaafm.org/ucla2021/
ucla2021@aaafm.org

AAAFM Materials For Life
American Association for Advances in Functional Materials

Abstract ID: 817

Symposium 1: Functional Materials for Energy Storage and Conversion Devices (FESC)

Poster/Oral Presentation

Topics: Solar Cells

Keywords: Ultrasound, Silicon, Solar Cell, FeB pair

Ultrasound as Functional Influence Tool on FeB pair Association in Silicon Solar Cells

Oleg Olikh[1], Vitaliy Kostylyov[2], Victor Vlasiuk[2], Roman Korkishko[2]

[1]Taras Shevchenko National University of Kyiv, Ukraine; [2]V. Lashkaryov Institute of Semiconductor Physic of NAS of Ukraine, Kyiv, Ukraine; olegolikh@knu.ua

Defects are crucial for solar cell (SC) performance. The irradiation and annealing are the widespread techniques of functional defect engineering. But another selective as well as room temperature realized way of defects modification is the ultrasound excitation in a crystal. The acoustic waves are able to cause redistribution of impurities, point defects rebuilding and affect SC properties as well [1]. In this work, the influence of ultrasound loading (USL) on a FeB pair association in silicon SC was under consideration. The iron is a major contaminant as well as one of the most detrimental impurities in silicon photovoltaic devices and the investigation is important from an applied point of view.

The Si-SC was fabricated from p-type boron doped wafer with <100> orientation and a doping level of 1.4 1015 cm-3. In USL case the longitudinal waves with 4.1 MHz frequency and up to ~0.5 W/cm2 intensity were exited. The FeB pair dissociation was made by halogen lamp illumination (0.25 W/cm2, 15 s). The short circuit current value (LED, 940 nm, 0.15 mW/cm2) was used to characterize recombination process in the SC base. The Isc kinetic was fitted by taking into account intrinsic recombination and to Shockley-Read-Hall recombination on interstitial iron and FeB pair and the iron atom migration energy Em was determined. The acousto-induced reduction in Em value has been revealed. The Em decrease runs up to 10 meV and non-linear depends on US intensity. Thus the ultrasound can be effective tool of defect engineering in solar cell functional materials. The work was supported by NRFU (project 2020.02/0036).

References

1. O. Ya. Olikh, A. M. Gorb, R. G. Chupryna, J. Appl. Phys., 123 (2018) 161573.