"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

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AAAFM - 9330 LBJ Freeway - Suite 934B - Dallas, Texas 75243, USA

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Los Angeles, USA, 02/Sept/2021

To Whom It May Concern

Dear Madam or Sir,

We confirm that **Dr. Oleg Olikh** participated at AAAFM-UCLA International Conference on Advances in Functional Materials 2021.

Dr. Oleg Olikh is author/co-author of the following accepted contribution(s):

Abstract ID: 817
Ultrasound as Functional Influence Tool on FeB pair Association in Silicon Solar Cells
Author(s): Olikh, Oleg; Kostylyov, Vitaliy; Vlasiuk, Victor; Korkishko, Roman
Presenting Author: Olikh, Oleg
Conference Track: Symposium 1: Functional Materials for Energy Storage and Conversion Devices (FESC)
Status: The abstract has been accepted for poster presentation.
Presented in Session: Post-1, **Time:** Wednesday, 18/Aug/2021: 1:00pm - 3:00pm, **Location:** Theatre, **Session Chair:** Monish Chatterjee

PS: If no session details are presenting, it means authors didn't show up or didn't present their work at AAAFM-UCLA,2021.

Organizing Committee
Advances in Functional Materials Conference
AAAFM-UCLA
August, 18-20, 2021
https://aaafm.org/ucla2021
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With profound advances in immune-oncology, cancer immunotherapy is now considered the fourth pillar of cancer therapy, joining the ranks of surgery, radiotherapy, and chemotherapy. However, only a small subset of cancer patients responds to cancer immunotherapy. While the combination of multiple immune checkpoint blockers generally improves the clinical responses, this can lead to severe immune-related adverse events that result in clinical manifestations of dermatitis, colitis and hepatitis. Thus, new approaches are needed to amplify anti-tumour T-cell immune responses, to convert cold tumours into hot tumours, and to sensitize tumours to immunotherapies with minimal immune-related adverse events. Here, we present new biomaterial-based strategies for amplifying anti-tumor immune responses and sensitizing tumors to immunotherapies in a safe and effective manner. Briefly, we show that lipid-based nanodiscs can efficiently co-deliver antigen and immunostimulatory molecules to draining lymph nodes and elicit potent CD8+ cytotoxic T lymphocyte responses directed against tumor antigens, leading to substantially enhanced anti-tumor efficacy in multiple murine tumor models, including colon carcinoma, melanoma, and glioblastoma multiforme. We have also demonstrated their efficacy in non-human primates. In a second research thrust, we are developing new biomaterials for in situ modulation of the gut microbiome for regulation of local and systemic immune responses. We will share our latest results showing the therapeutic potential of our gut modulation approach in the context of improving the safety and efficacy of immune checkpoint blockers. Owning to the facile manufacturing process, robust therapeutic efficacy, and good safety profiles, our biomaterial-based approaches may offer powerful and convenient platforms for improving cancer immunotherapy and cancer patient outcomes.

2:09pm - 2:12pm

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]
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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.

2:12pm - 2:15pm Warning: The presentations finish prior to the end of the session!

Rechargeable Magnesium Battery Cathodes Based on Fluorine-free MXenes

Frode Håskjold Fagerli[1], Henning Kaland[1], Jacob Hadler-Jacobsen[1], Zhaohui Wang[1,2], Sverre M. Selbach[1], Tor Grande[1], Nils P Wagner[1,3], Kjell Wiik[1]
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In order for rechargeable Mg batteries (RMBs) to compete with the energy density of today's Li-ion batteries, cathode materials with improved capacity and voltage must be realised.[1] Today's cathode materials suffer from either irreversible intercalation or insufficient energy density, which partly is due to the higher charge density of the divalent Mg-ions compared to Li-ions. One type of material that has been proposed as a possible candidate is the 2D MXene family, where the oxygen terminated vanadium based MXene, V2COx, has shown the highest intercalation energies and lowest migration barriers from DFT calculations.[2] Here, we report on a fluorine-free synthesis route for V2CTx MXene (T = O or OH) by an alkaline etching process. We also show how the material changes by various post-etching treatments. To verify the chemical and structural changes, EDS, XPS, XRD, SEM and Raman spectroscopy are utilized. The effect of the termination groups on the average potential and reversible capacity is experimentally determined and further discussed.