International Conference "Functional Materials"

ICFM - 2013

ABSTRACTS

Ukraine, Crimea, Partenit
2013

The conference is dedicated to
150th Anniversary of V. I. Vernadsky
95th Anniversary of Taurida National V. I. Vernadsky University

FUNCTIONAL MATERIALS-2013

ABSTRACTS
of International Conference
"Functional Materials"
ICFM'2013

September 29 – October 5, 2013
Ukraine, Crimea, Yalta, Haspra

Simferopol
DIP
2013

УДК 538.9/539
ББК 30.3+72(4Укр–6)л0
F 97

У книзі представлені тези доповідей Міжнародної конференції «Функціональні матеріали-2013» ICFM'2013. Конференція присвячена актуальним проблемам фізики, технології та застосування нових матеріалів і структур з певними функціональними властивостями.

Для учених та аспірантів, які працюють в області фізики, технології і застосування функціональних матеріалів.

F 97 FUNCTIONAL MATERIALS – 2013: Abstracts of International Conference "Functional Materials" ICFM'2013, September 29 – October 5, 2013 / Edited by V. Berzhansky. – Simferopol, DIP, 2013. – 502 p.

ISBN 978-966-491-465-6

In the book are presented reports abstracts of International Conference "Functional Materials - 2013" ICFM'2013. Conference is devoted to actual problems of physics, technology and applications of new materials and structures with the certain functional properties.

For scientists and graduate students in the field of physics, technologies and application of functional materials.

УДК 538.9/539
ББК 30.3+72(4Укр–6)л0

Функциональные материалы – 2013: Тезисы Международной конференции «Функциональные материалы» ICFM'2013, 29 сентября – 5 октября, 2013 г. Научное издание / Под редакцией В. Бержанского. – Симферополь, ДИАЙПИ, 2013. – 502 с.

В книге представлены тезисы докладов Международной конференции «Функциональные материалы-2013» ICFM'2013. Конференция посвящена актуальным проблемам физики, технологии и применения новых материалов и структур с определенными функциональными свойствами.

Для ученых и аспирантов, которые работают в области физики, технологии и применения функциональных материалов.

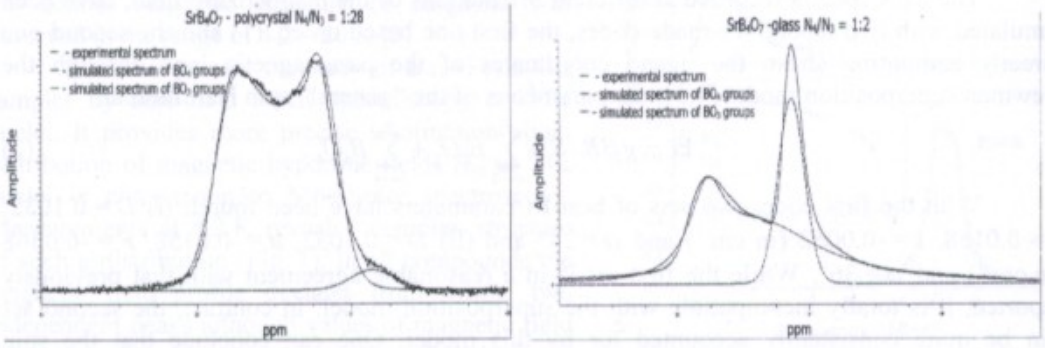
ISBN 978-966-491-465-6

BQ-1P/13 ^{11}B and ^{7}Li NMR MAS of Glassy and Crystaline Borate Compounds

Sergeev N.A.[1], Padlyak B.V.[2,3], Olszewski M.[1], Stępień P.[1]

[1] *Institute of Physics, University of Szczecin, 15 Wielkopolska Str., 70-451, Szczecin, Poland*
[2] *Spectroscopy Sector, Institute of Physical Optics, 23 Dragomanov Str., 79-005, Lviv, Ukraine*
[3] *Division of Spectroscopy of Functional Materials, Institute of Physics, University of Zielona Góra, 4a Szafrana Str., 65-516, Zielona Góra, Poland*

The nuclear magnetic resonance magic angle spinning (NMR MAS) spectra of the ^{11}B and ^{7}Li isotopes in a series of un-doped glassy and crystalline borate compounds with $Li_2B_4O_7$, LiB_3O_5, $LiCaBO_3$, $LiKB_4O_7$ and SrB_4O_7 chemical compositions were investigated and analysed. The investigated borate glasses of high optical quality and chemical purity were obtained from corresponding polycrystalline compounds using standard glass synthesis shown in [1]. The main structural units (BO_3, BO_4, and LiO_4 atomic groups) and their proportions in the $Li_2B_4O_7$, LiB_3O_5, $LiCaBO_3$, $LiKB_4O_7$ and SrB_4O_7 glasses and polycrystals have been determined on the basis of the comparative analysis of their ^{11}B and ^{7}Li NMR MAS experimental spectra. The obtained results of NMR MAS spectroscopy show good correlation with X-ray diffraction data for local structure of the cationic sites in borate glasses [1] and crystals of the same chemical compositions.



(a) (b)

Fig. 1. The NMR MAS spectra of ^{11}B *in the polycrystalline (a) and glassy (b) compounds with* SrB_4O_7 *composition. The* N_4 *and* N_3 *are the fractions of the boron atoms in the* BO_4 *and* BO_3 *groups, respectively*

Reference

[1] B.V. Padlyak, S.I. Mudry, Y.O. Kulyk, A. Drzewiecki, V.T. Adamiv, Y.V. Burak, I.M. Teslyuk, *Mater. Sci.-Poland* **30**, 264 (2012).