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BOOK OF ABSTRACTS

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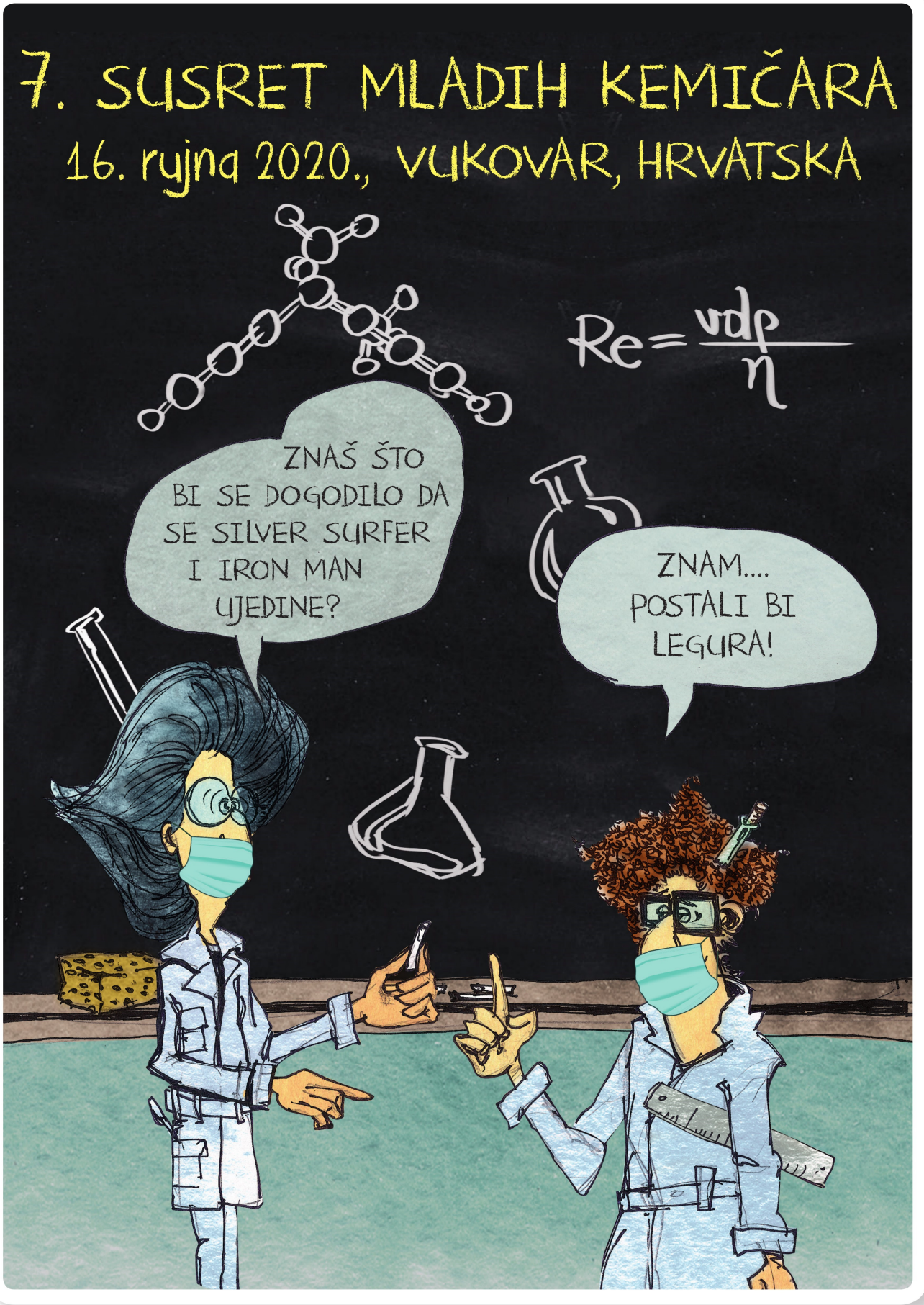
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DANAS ZNANOST – SUTRA INDUSTRIJA

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KNJIGA SAŽETAKA

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PREDNOST OTOPINSKIH METODA ZA SINTEZU $Sr_3Fe_2WO_9$

ADVANTAGE OF SOLUTION METHODS TOWARDS SYNTHESIS OF $Sr_3Fe_2WO_9$

Jelena Bijelić[1], Dalibor Tatar[1], Anna-Marija Milardović[1], Antonia Vicić[1], Anamarija Stanković[1], Pascal Cop[2], Sebastian Werner[2], Zvonko Jagličić[3,4], Bernd Smarsly[2], Igor Djerdj[1]

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The properties of materials have appeared to be size- and shape-dependent which is why in this work we compare two synthesis routes: sol-gel solution synthesis and solid state synthesis of triple $Sr_3Fe_2WO_9$ perovskite. This material has been prepared in form of semi-spherical particle agglomerates using a modified aqueous sol–gel citrate route and as a bulk material using solid state synthesis by means of planetary ball milling. Structural investigation has been conducted by ambient and in situ X-ray powder diffraction (XPRD), X-ray photoelectron spectroscopy (XPS), high resolution transmission electron microscopy (HRTEM), selected area electron diffraction (SAED), thermogravimetric analysis (TGA) and unpolarized Raman spectroscopy. Results of powder X-ray diffraction show phase pure nanocrystalline $Sr_3Fe_2WO_9$ prepared by sol-gel route, while compounds prepared by solid state method contained larger amount of impurities. It has been revealed that synthesized compound crystalizes in tetragonal system (space group *I*4/*m*) with crystallite size of 36 nm and high crystallinity. Magnetic properties have been determined using SQUID measurements and have shown ferrimagnetic ordering with gradual transition around Curie temperature of 213 K as opposed to bulk $Sr_3Fe_2WO_9$ with sharp transition at 373 K. Optical properties have been estimated using Tauc method which revealed band gap values of 2.71 eV for direct band gap and 2.10 eV for indirect band gap.

Keywords: nanocrystalline, triple perovskite, sol-gel synthesis, solid state reactions

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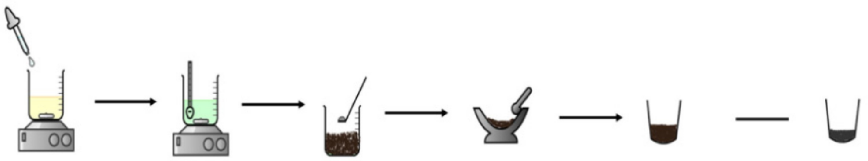

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