

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Search for Very High- T_c Superconductivity in Modified Compositions of Strontium Ruthenates¹ ARMEN GULIAN, VAHAN NIKOGHOSYAN, Advanced Physics Laboratory, Chapman University — In 2004-2007 we discovered unusual properties in laser-processed crystals of strontium ruthenates (including resistive and magnetic transitions) pointing towards superconductivity at 200K and higher [1]. Being interested in understanding and reproducing their properties we explored their composition further. We obtained, via Auger-analysis, the presence of sulfur in the explored sample. The appearance of iron-based superconductors further enhanced our interest, since compositionally our materials turned out to be close to some of these new materials. If our reported observations [1] have been caused by superconductivity that may mean that one can get T_c as high as 200-250K or even higher with these materials at proper processing. We undertook systematic research of ceramic materials Sr_2RuO_4 with sulfur and other dopants. Data on resistive, magnetic and other physical properties, as well as preparation techniques are reported. [1] A.M. Gulian, V.R. Nikoghosyan, Unusual properties of laser-processed strontium ruthenates, in: T. Frias, V. Maestas (Eds.), Bulk Materials: Research, Technology and Applications, Nova Science Publishers, Inc., NY, 2010, Ch. 9 (see also arXiv: cond-mat/0509313 and cond-mat/0705.0641).

¹This work is supported by ONR Grants N000141210768 and N000141210244

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Date submitted: 08 Nov 2012

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