Synthesis of Nb-doped SrTiO$_3$ by a modified glycine-nitrate process

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The objective of the present investigation was to develop a technique to synthesize submicronic particles of Nb-doped strontium titanate with a homogeneous composition. This was achieved by a modified glycine-nitrate process, using Ti-lactate, Nb-oxalate, and Sr(NO$_3$)$_2$ as starting materials. A combination of both citric acid and glycine was needed in order to integrate the useful features of both complexation and combustion natures of citric acid and glycine, respectively. The amount of citric acid, glycine, and nitrates in the starting solution, as well as the source for extra nitrates, and the uniformity of heating during the thermal dehydration step were found to have significant influence on the final phase purity of the material. Calcination at 1100 degrees C in 7% H$_2$ in N$_2$ produced single phase Nb-doped strontium titanate with grain sizes of about 100 nm in diameter on average. (c) 2007 Elsevier Ltd. All rights reserved.

**General information**

State: Published  
Organisations: Ceramic processing, Fuel Cells and Solid State Chemistry Division, Risø National Laboratory for Sustainable Energy, Electrochemistry  
Contributors: Blennow Tullmar, P., Kammer Hansen, K., Wallenberg, L., Mogensen, M. B.  
Pages: 3609-3612  
Publication date: 2007  
Peer-reviewed: Yes

**Publication Information**

Journal: Journal of the European Ceramic Society  
Volume: 27  
Issue number: 13-15  
ISSN (Print): 0955-2219  
Ratings:  
Web of Science (2019): Indexed yes  
BFI (2018): BFI-level 1  
Web of Science (2018): Indexed yes  
BFI (2017): BFI-level 1  
Scopus rating (2017): CiteScore 3.55 SJR 1.068 SNIP 1.698  
Web of Science (2017): Impact factor 3.794  
Web of Science (2017): Indexed yes  
BFI (2016): BFI-level 1  
Scopus rating (2016): CiteScore 3.25 SJR 1.142 SNIP 1.888  
Web of Science (2016): Impact factor 3.454  
Web of Science (2016): Indexed yes  
BFI (2015): BFI-level 1  
Scopus rating (2015): CiteScore 3.03 SJR 1.135 SNIP 1.817  
Web of Science (2015): Impact factor 2.933  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 1  
Scopus rating (2014): CiteScore 3.16 SJR 1.163 SNIP 2.083  
Web of Science (2014): Impact factor 2.947  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 1  
Scopus rating (2013): CiteScore 2.57 SJR 1.111 SNIP 1.79  
Web of Science (2013): Impact factor 2.307  
ISI indexed (2013): ISI indexed yes  
Web of Science (2013): Indexed yes  
BFI (2012): BFI-level 1  
Scopus rating (2012): CiteScore 2.81 SJR 1.293 SNIP 2.207  
Web of Science (2012): Impact factor 2.36  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 1  
Scopus rating (2011): CiteScore 2.83 SJR 1.343 SNIP 2.195
Web of Science (2011): Impact factor 2.353
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.383 SNIP 1.93
Web of Science (2010): Impact factor 2.575
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.374 SNIP 1.712
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.139 SNIP 1.627
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.212 SNIP 1.745
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.22 SNIP 1.665
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.095 SNIP 1.633
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.055 SNIP 1.743
Scopus rating (2003): SJR 1.151 SNIP 1.496
Scopus rating (2002): SJR 1.101 SNIP 1.184
Scopus rating (2001): SJR 1.236 SNIP 1.593
Scopus rating (2000): SJR 0.829 SNIP 1.179
Scopus rating (1999): SJR 1.11 SNIP 1.182
Original language: English
Keywords: Nb-doped SrTiO3, Powders-chemical preparations, Electron microscopy, Microstructure-final
DOIs:
10.1016/j.jeurceramsoc.2007.02.009
Source: orbit
Source-ID: 216065
Research output: Research - peer-review › Journal article – Annual report year: 2007