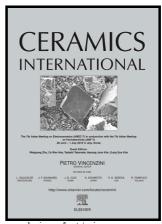
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ACCEPTED MANUSCRIPT

Effect of neodymium substitution on crystalline orientation, microstructure and electric properties of sol-gel derived PZT thin films

Qi Li^a, Xing Wang^a, Fuan Wang^a, Da Chen^a, Xiaolei Xiao^a, Helin Zou^{a,b,*}

^a Key Laboratory for Micro/Nano Technology and Systems of Liaoning Province, Dalian University of

Technology, Dalian 116024, People's Republic of China

^b Key Laboratory for Precision and Non-traditional Machining Technology of Ministry of Education,

Dalian University of Technology, Dalian 116024, People's Republic of China

*E-mail address: zouhl@dlut.edu.cn

Abstract

Pb(Nd_xZr_{0.52}Ti_{0.48})O₃ (PNZT) (x=0%, 1%, 2%, 3%, 4%, 5%) thin films were prepared by sol-gel process

to investigate the effects of neodymium substitution on crystalline orientation, microstructure and electric

properties of lead zirconate titanate (PZT) films. X-ray diffraction (XRD) and scanning electron

microscope (SEM) analysis showed that PNZT films with Nd doping concentration below 3% exhibited

dense perovskite structure with (100) preferred orientation. The average grain size of PNZT films

decreased as the Nd substitution increased. The maximum dielectric constant, remnant polarization and

minimum coercive field were obtained in 2% Nd-doped PZT films. Fatigue resistance was also improved

significantly with 2% Nd dopant.

Keywords: PNZT thin films; (100) preferred orientation; microstructure; electric properties; sol-gel

process.

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