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P.132	Optimization of La₂NiO₄ cathode for SOFC
	Bernard A. Boukamp , Nicolas Hildenbrand and Dave H.A. Blank University of Twente, Dept. of Science and Technology & MESA ⁺ Institute for Nanotechnology, P.O. Box 217, 7500AE Enschede, The Netherlands

The commercialisation of Solid Oxide Fuel Cells requires stable and cheap components. Although La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-δ} is an excellent cathode material, it suffers from Cr-poisoning by the metallic CrO₂ interconnect, which has led to a search for Cr-resistant cathode materials. One of the possible candidates is La₂NiO₄ (LNO), a layered compound with high (2-D) ionic conductivity and high surface oxygen exchange rate. The influence of microstructure on the electrode properties are investigated with impedance spectroscopy. Addition of a dense LNO-layer by Pulsed Laser Deposition between electrolyte and the porous, screen printed LNO electrode significantly lowers the electrode polarisation. Interpretation of the impedance analysis indicates that the electronic resistance of the LNO-electrode is a performance limiting factor. It is also evident from the observation of a predominant Gerischer contribution to the impedance of the porous cathodes that surface diffusion of (possibly charged) oxygen species is the main oxygen transport mechanism. The cathode with the 800 nm LNO-PLD layer can be modelled with a previously developed model for a dense layer electrode where the oxygen exchange rate is modified by the porous LNO structure on top of the layer.

P.133	Electrical Properties Of Pb(Zr_{0.52}Ti_{0.48})O₃ Ceramics Measured at High Frequency
	Juliewatty J. M. ^{1, a} , N. S. A. Sharif ^{2, b} and W. A. W. Yusoff ^{3, c} ^{1, 2} School of Materials and Mineral Resources Engineering, USM Engineering Campus, 14300 Nibong Tebal, Penang, Malaysia, ³ Faculty of Manufacturing Engineering, UMP Kampus Pekan, 26600 Pekan, Pahang, Malaysia

High planetary mill has been used successfully to produce lead zirconate titanate Pb(Zr_{0.52}Ti_{0.48})O₃ using commercial mixtures of PbO, ZrO₂ and TiO₂ powders. The milled powders were studied by X-ray diffraction (XRD) and Scanning Electron Microscope (SEM) for phase formation and microstructure characterization. The X-ray diffraction (XRD) patterns indicate that the perovskite phase of PZT was formed after milled for 40 hours. After samples were sintered at 950 °C for 1 hour, the analysis proved the formation of Pb(Zr_{0.52}Ti_{0.48})O₃ single phase. According to SEM results, the grain sizes of the powders have been estimated to be ~200 nm while after sintered a dense and clearly uniform grain size were observed to be about ~2µm. Dielectric properties were measured at frequency range of 1 MHz to 1 GHz. It was found that the dielectric constant of PZT ceramics to be ~7000, meanwhile, the dielectric loss is ~0.04 measured at 1 MHz. Moreover, results also indicate that high planetary mill is an effective technique to improve the sinterability of PZT ceramics where the relative density of sintered samples was measured to be about 99.93% from the theoretical density.

P.134	Influence of growth conditions on PbZr_{0.20}Ti_{0.80}O₃ thin films
	Werner Wessels , Anuj Chopra, Gertjan Koster and Guus Rijnders MESA+ Institute for nanotechnology, University of Twente, Enschede, The Netherlands

We report on growth and ferroelectric properties of epitaxial PbZr_{0.20}Ti_{0.80}O₃ (001) films. Single phase epitaxial films were grown on vicinal SrTiO₃ (001) and DyScO₃ (110) substrates with a layer of SrRuO₃ as bottom electrode by pulsed laser deposition. In order to investigate the influence of oxygen background pressure on microstructure and

ferroelectric properties of PZT films, the background pressure for PZT growth was varied from 0.08 mbar O₂ to 0.274 mbar O₂. The crystal orientation and topography of the films were analysed by X-ray diffraction and atomic force microscopy respectively. The influence of oxygen pressure on microstructure was studied through RHEED during the growth and afterwards investigated by RSM. Further, ferroelectric and piezoelectric properties of these films were investigated macroscopically and microscopically.