

Curriculum vitae for Truls NORBY

Full name: Norby, Truls Eivind

Born: 22 June 1955, Oslo, Norway

Degree: Dr. Scient., Inorganic Chemistry, University of Oslo (UiO) 1986

Present position: Professor, Dept. Chemistry, University of Oslo 1995-.
Head of Group for Solid-State Electrochemistry;

<http://www.mn.uio.no/kjemi/english/people/aca/trulsn/index.html>.



Research activities and fields of interest: Inorganic and physical materials chemistry, electrochemistry. Advanced ceramic materials, mainly oxides; defect structure, diffusivity, electrical properties and electrochemistry at high temperatures. Hydrogen defects. Solid oxide fuel cells (SOFC), electrochemical reactors, pumps, sensors. Mixed conductors and electronic conductors for membrane and electrode technologies. Nano-ionics. *Current foci:* Solubility and transport of protons in oxides and salts. Neutral hydrogen and hydride ions in oxides. Solid-state protonic conductors for electrolyzers, fuel cells, sensors, and membrane reactors for green fuels, chemical processes and gas separation/cleaning. Surface protonics. Chemical diffusion of oxygen or hydrogen through mixed conductors as membranes for separation of O₂ from air or H₂ from syngas. Photoelectrochemistry; defects in photocatalysts, e.g. TiO₂. Thermoelectricity. Computational materials chemistry.

Academic and organizational involvements: Member of The Norwegian Academy of Science and Letters (Det Norske Vitenskapsakademi), Norwegian Academy of Technological Sciences, Agder Academy of Science and Letters. Editor for *Solid State Ionics* 2006-. Int. adv. boards: Solid State Ionics, Solid State Protonic Cond's., a.o. Member of The Hydrogen Council (RCN) 2006-2014, Sintef's Council 2006-2013, board of Norwegian Hydrogen Forum 2016-. Coordinator of EU projects 7FWP "EFFIPRO" 2009-12 and EU FCH JU "ELECTRA" 2014-17. Leads additionally many national RCN research projects.

Innovation: 2 granted patents and 5 applications. Founded *NorECs AS* (www.norecs.com) 2001, commercialising equipment and materials developed by Norwegian academic materials research. Initiator and board member of Protia AS, now CoorsTek Membrane Sciences AS, commercialising processes based on proton conducting ceramics. Awarded UiO's Innovation Prize 2012.

Visiting scientist: Chalmers 1993, Aveiro 2002, Sydney UNSW 2009, Montpellier 2015.

Supervision: Educated >30 PhD and >50 MSc students. Currently 10 PhD and MSc students.

Teaching: Lecturer in UiO courses MENA1001, MENA3200, KJM-MENA3120, KJM5120.

H-factors WoS all years: 37. Google Scholar (GS) all years: 46. Last 5 years: 32.

5 selected recent publications among a total of >210 peer reviewed articles (with GS citations):

* R. Haugsrud, T. Norby, "Proton conduction in rare earth ortho-niobates and ortho-tantalates", *Nature Materials*, **5** (2006) 193. (325)

* C. Kjølseth, ..., T. Norby, "Space charge theory applied to the grain boundary impedance of proton conducting BaZr_{0.9}Y_{0.1}O_{3-δ}", *Solid State Ionics*, **181** (2010) 268. (121)

* T. Bjørheim, A. Kuwabara, T. Norby, "Defect Chemistry of Rutile TiO₂ from First Principles Calculations", *J. Phys. Chem. C*, **117** [11] (2013) 5919. (24)

* M. Schrade, H. Fjeld, T. Finstad, T. Norby, "Electronic transport properties of [Ca₂CoO_{3-δ}]_q[CoO₂]", *J. Phys. Chem. C*, **118** (2014) 2908. (22)

* S.H. Morejudo, ..., T. Norby, J.M. Serra, C. Kjølseth, "Direct conversion of methane to aromatics in a catalytic co-ionic membrane reactor", *Science*, **353** [6299] (2016). (17)