

## Prof. Vadim Kessler

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Born January 22, 1966, male, married



### **Education**

- 1987-1990 Doctor of Philosophy in Inorganic Chemistry, Moscow State University, September 14 1990.  
Title of thesis: *Synthesis and Physico-Chemical Properties of Molybdenum(VI) alkoxides.*
- 1982-1987 MSc Chemistry, Moscow State University.

### **Professional positions**

- 2004-present Professor of Inorganic Chemistry and Bionanotechnology
- 1997-2004 Associate Professor of Inorganic Chemistry, Department of Chemistry, SLU
- 1995-1997 Associate Professor, Department of Inorganic Chemistry, Moscow State University
- 1990-1995 Assistant Professor, Department of Inorganic Chemistry, Moscow State University

### **International activities**

- 2001 Guest Researcher, Univ. Newcastle-upon-Tyne, UK;
- 2002 Invited Professor, Lab. de Multimateriaux et Interfaces, Univ. Claude Bernard Lyon-1, France;
- 2006 Invited Professor, Lab. de Materiaux hors equilibre, Univ. Paris-Sud, France,
- 2009 Invited Professor, Lab. de Materiaux Inorganiques, Univ. Clermont-Ferrand, France,
- 2010 Invited Professor, Univ. Ruhr Bochum, Germany,
- 2012 Invited Professor, University Paris-Nord,
- 2015 Invited Professor, Lab. de Materiaux Inorganiques, Univ. Clermont-Ferrand, France.

### **Supervision of doctoral and post-doctoral students**

**Main supervisor** to: (1) Pia Werndrup, 2005, Thesis title "Synthesis, Structure Determination, and Sol-Gel Processing of Heterometallic Heteroleptic Alkoxide Complexes of Late Transition Metals". (2) Gerald Spijksma, 2006, Thesis title "The influence of Modifying Ligands on the Structure, Stability and Materials Science Applications of Zirconium and Hafnium Precursors" (3) Kai Wilkinson, 2013, Project Title "Particle Impurities in Air: Express-Analysis and Health Effects". (4) Olga Galkina, "Titanium dioxide – cellulose nanocomposites for medical applications", Thesis defended June 11<sup>th</sup> 2015, (5) Martin Palmqvist, "Nanotechnology for Innovative Protection against Insect Pests" defended December 1st 2017, (6) Fredric Svensson, current, "Hybrid nanostructures as nanoreactors for CO<sub>2</sub> reduction and drug delivery vehicles".

**Assistant Supervisor** to: Camelia Hagfeldt. (major supervisor Prof. I.Persson). Licentiate Thesis Defended 28/03/2003, Department of Chemistry, SLU; Kersti Nilsson, (major supervisor Prof. I.Persson). Doctoral Thesis defended 23/03/2005), Department of Chemistry, SLU; Olesya Nikonova (major supervisor Dr. G. Seisenbaeva). PhD Thesis Defended 15/05/2011, Department

of Chemistry, SLU; Elizabeth Polido Legaria (major supervisor Dr. G. Seisenbaeva), defended on February 9th 2018.

**Supervision of postdocs.** Elena Ilina, supported by Swedish Institute, 2002-2003; Giovana Gioppo Nunes, supported by Capes (Brazil), 2005-2006; Robert Pazik, supported by SLU grant “Nanomaterials for Biological and Medical Diagnostics”, 2008-2010; Karin Önneby, supported by VINNOVA (2014-2015).

#### *Honors and awards*

- 2001** RSC Journal Grant for publications in Dalton Transactions
- 2002** Feature Article to Chemical Communications.
- 2003** International Donald Ulrich Award for excellence in Sol-Gel Science.
- 2004** Exxon Benelux Award to a group member Ph.D. student Gerald Spijksma for the studies of precursors of porous material;
- 2007** NATO ARW (Advanced Research Workshop) Grant Award,
- 2014** Feature Article to Nanoscale.
- 2015** Admission as Fellow to the Royal Society of Chemistry, UK

#### *Expert appointments and other external activities*

- 2017-present Associate Editor of “*Scientific Reports*”, Nature Publishing Group
- 2013-present Advisory Board of the Journal “*Advances in Nano Research*”
- 2004-present Advisory Board of Springer “*Journal of Sol-Gel Science and Technology*”

**Research policy assignments:** NTD-2 and then NT-6 Commission member, Swedish Research Council; Swedish Research Council Formas, External grant evaluator for Science Foundation Ireland, The Austrian Technical Research Council (FWF), American Chemical Society Petroleum Research Fund, Israel Science Foundation, Royal Society of Chemistry (UK) Energy Research Fund; EU Marie Curie Program; Flemish Research Council (FWO), Belgian Science Policy Office.

**External expert for employment as Full Professor:** Hasselt, Belgium, 2009, Åbo Akademi, Finland, 2011, Uppsala University 2015, Linköping University 2016.

**Referee for international journals (selected):** Nature, Scientific Reports, Advanced Materials, Advanced Functional Materials, Angewandte Chemie, Chemistry – A European Journal, Dalton Transactions, European Journal of Inorganic Chemistry, Inorganic Chemistry, Inorganic Chemistry Communications, Journal of the American Chemical Society, Journal of Materials Chemistry, Journal of Physical Chemistry C, Physical Chemistry Chemical Physics, Journal of Sol-Gel Science and Technology, Journal of Solid-State Chemistry, Langmuir, Materials Chemistry and Physics, New Journal of Chemistry, Surface and Coatings Technology, Optical Materials, Polyhedron, etc.

#### *Invitations (symposia, reviews)*

On average ~ 10 a year for the last 6 years

#### *Publications*

C. 230 peer-reviewed original articles, H-index = 38 (Google Scholar), year of first publication = 1987 and a total of 5082 citations (source Google Scholar 2019-01-03).

#### *Grants*

In total, I have received external funding, as principal investigator exceeding € 3M including the grants from Swedish Research Council, Swedish Research Council Formas, Vinnova, EU, Swedish Environmental Agency, and industrial partners and invited professorships in Europe.

*Ten selected publications*

Ekdahl K.N., Davoodpour P., Ekstrand-Hammarström B., Fromell K., Hamad O.A., Hong J., Bucht A., Mohlin C., Seisenbaeva G.A., Kessler V.G., Nilsson B., *Contact (kallikrein/kinin) system activation in whole human blood induced by low concentrations of  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> nanoparticles*, *Nanomedicine: Nanotechnology, Biology and Medicine*, (in press), <https://doi.org/10.1016/j.nano.2017.12.008>.

Seisenbaeva G.A., Fromell K., Vinogradov V.V., Terekhov A.N., Pakhomov A.V., Nilsson B., Nilsson Ekdahl K., Vinogradov V.V., Kessler V.G., *Dispersion of TiO<sub>2</sub> nanoparticles improves burn wound healing and tissue regeneration through specific interaction with blood serum proteins*, *Sci. Rep., Nature PG*, **2017**, 7, 15448.

Youn W., Ko E.H., Kim M.H., Park M., Hong D., Seisenbaeva G.A., Kessler V.G., Choi I.S., *Cytoprotective Encapsulation of Individual Jurkat T Cells within Durable TiO<sub>2</sub> Shells for T-Cell Therapy*, *Angew. Chem. Int. Ed.*, **2017**, 56, 10702-10706.

Palmqvist N. G. M., Bejai S., Meijer J., Seisenbaeva G. A., Kessler V. G., *Nano titania aided clustering and adhesion of beneficial bacteria to plant roots to enhance crop growth and stress management*, *Sci. Rep., Nature PG*, **2015**, 5, 10146.

Galkina O.L., Önnby K., Huang P., Ivanov V.K., Agafonov A.V., Seisenbaeva G.A., Kessler V.G., *Antibacterial and photochemical properties of cellulose nanofibers–titania nanocomposites loaded with two different types of antibiotic medicines*, *J Mater Chem B*, 2015, **3**, 7125-7134.

Seisenbaeva G.A., Kessler V.G., *Precursor directed synthesis – “molecular” mechanisms in the Soft Chemistry approaches and their use for template-free synthesis of metal, metal oxide and metal chalcogenide nanoparticles and nanostructures*, *Nanoscale*, 2014, **6**, 6229-6244.

Wilkinson K.E., Ekstrand-Hammarström B., Ahlinder L., Guldevall K., Pazik R., Kępiński L., Kvashnina K.O., Butorin S., Brismar H., Önfelt B., Österlund L., Seisenbaeva G.A., Kessler V.G., *Visualization of Custom-tailored Iron Oxide Nanoparticles Chemistry, Uptake, and Toxicity*, *Nanoscale* **2012**, 4, 7383-7393.

Pazik R., Andersson R., Kępiński L., Kessler V.G., Nedelec J.M., Seisenbaeva G.A., *Surface Functionalization of Metal Oxide Nanoparticles with Biologically Active Molecules Containing Phosphonate Moieties*, *J. Phys. Chem. C*, 2011, **115**(20), 9850-9860.

Kessler V.G., Seisenbaeva G.A., Håkansson S., Unell M., *Chemically triggered biodelivery using metal-organic sol-gel synthesis*, *Angew. Chem.*, 2008, **47**(44), 8506-8509.

Kessler V.G., *Molecular Structure Design and Synthetic Approaches to the Heterometallic Alkoxide Complexes (Soft Chemistry Approach to Inorganic Materials by the Eyes of a Crystallographer)*, *Chem. Commun.*, **2003**, 1213-1222.