Curriculum vitae

Full name:	Tore Haug-Warberg	
Date of birth:	13 November 1958	
Nationality:	Norwegian	
Present position:	Associate Professor	
Academic degrees:	Civil engineer (1982), Dr.ing. (1988)	
Work experience:	Norsk Hydro AS	(1983-6, 1992-6)
	University of Calgary	(1989)
	Institute of Energy Technology	(1990-1)
	Telemark College	(1997-2002)
	Norwegian University of Science and Technology	(2003-8, 2010-2)
	Full-time consultant for Yara ASA	(2009)
	Tore Haug-Warberg Technology (org. nr. 993839442)	(2009-13)

PhD students

Egil Brendsdal:	Computation of Phase Equilibria in Fluid Mixtures (1999)
Volker Siepmann:	Process Modelling on a Canonical Basis (2006)
Bjørn Tore Løvfall:	Portable Thermodynamics (2008)
Olaf Trygve Berglihn:	Canonical Modelling of Dynamic Processes (2010)
Geir Arne Evjen:	Object-Oriented Thermodynamics Solutions (planned 2013)

Recent publications

Kim, I., Hessen, E. T., Haug-Warberg, T., Svendsen, H. F., *Enthalpies of absorption of CO2 in aqueous alkanolamine solutions from e-NRTL model*, Energy Procedia, 1(1), Proceedings of the 9th International Conference on Greenhouse Gas Control Technologies (GHGT-9), 829-835, 2009.

Kim, I., Hoff, K. A., Hessen, E. T., Haug-Warberg, T., Svendsen, H. F., *Enthalpy of absorption of CO2 with alkanolamine solutions predicted from reaction equilibrium constants*, Chem. Eng. Sci., 64(9), 2027-2038, 2009.

Hessen, E. T., Haug-Warberg, T., Svendsen, H. F., *Thermodynamic models for CO2 - H2O - alkanolamine systems, a discussion*, Energy Procedia, Volume 1(1), Proceedings of the 9th International Conference on Greenhouse Gas Control Technologies (GHGT-9), 971-978, 2009.

Preisig, H. A., Haug-Warberg, T., *Generating Portable High-Level Process Models and Stand-Alone Special-Purpose Simulators*, 10th International Symposium on Process Systems Engineering: Part A, Pages 687-692.

Knuutila, H., Hessen, E. T., Kim, I., Haug-Warberg, T., Svendsen, H. F., *Vapor-liquid equilibrium in the sodium carbonate - sodium bicarbonate – water - CO2-system*, Chem. Eng. Sci., 65(6), 2218-2226, 2010.

Hessen, E. T., Haug-Warberg, T., Svendsen, H. F., *The refined e-NRTL model applied to CO2-H2O-alkanolamine systems*, Chem. Eng. Sci., 65 (11) 2010, 3638-3648.

Aronu, U. E., Hessen, E. T., Haug-Warberg, T., Hoff, K. A. and Svendsen, H. F., *Equilibrium absorption of carbon dioxide by amino acid salt and amine amino acid salt solutions*, Energy Procedia, (4) 2011, 109-116.

Aronu, U. E., Gondal, S., Hessen, E. T., Haug-Warberg, T., Hartono, A., Hoff, K. A., Svendsen, H. F., *Solubility of CO2 in 15, 30, 45 and 60 mass% MEA from 40 to 120° C and model representation using the extended UNIQUAC framework*. *Chemical Engineering Science*, *66* (24) 2011, 6393-6406.

Aronu, U. E., Hessen, E. T., Haug-Warberg, T., Hoff, K. A. and Svendsen, H. F., *Vapor–liquid equilibrium in amino acid salt system: Experiments and modeling*, Chem. Eng. Sci., 66 (10), 2191-2198, 2011.

Mehdizadeh, H., Haug-Warberg, T., Svendsen, H. F., *Evaluation of Parameter Fitting Procedures for Rigorous Equilibrium Model Development. Energy Procedia*, *23,* 119-128, 2012.

Preisig, Heinz A., and Tore Haug-Warberg. *Ontology approach to model construction.* In *22nd European Symposium on Computer Aided Process Engineering*, vol. 30, p. 992. Access Online via Elsevier, 2012.

Industrial research

1994-1996	Part-time consultant for Simrad Norge A/S: Design and prototyping of thermodynamic equilibrium computations in the commercial process simulator CADAS.
1997-2000	Theoretical basis of HERE (energy reporting system used world wide in Norsk Hydro).
2004-2006	Theoretical basis of YASIM I (experimental flowsheet simulator originally sponsored by Hydro and later Yara).
2005-2007	Thermodynamic modelling of NPK fertilizer liquids (Yara).
2006-2008	Portable thermodynamics software (Statoil, Hydro, Yara).
2008-2009	Full-time consultant for Yara: Theoretical basis, program structure, and solver technology of YASIM II (fourth generation flowsheet simulator used in Yara).
2008-2009	Part-time consultant for the Norwegian Defence Office: Theoretical basis and solver technology of high explosive detonation computations (replacing the Cheetah code from Lawrence Livermore National Lab).
2009-2010	Part-time consultant for Yara: Securing the thermodynamic basis for process simulation studies of Ammonia, Urea and Nitric acid plants.
2011-2013	Part-time consultant for Petrell AS: Replacement of SuperTrapp and RefProps (from NIST) into (in-house fluid flow programs) Brilliant and VessFire.