



Low-GWP Refrigerants: 2023 Status and Outlook

——Dr. Piotr A. Domanski, National Institute of Standards and Technology, USA

Piotr A. Domanski has been associated with the National Institute of Standards and Technology, Gaithersburg, MD, USA for almost forty years where he led the HVAC&R Equipment Performance Group for over two decades before becoming a NIST Fellow.

His research focused on alternative refrigerants and on modeling of vapor-compression air-conditioning equipment. His current interests also include evolutionary computation-based optimization methods, automated commissioning, and fault detection and diagnostics with the goal to improve the performance of air conditioners and heat pumps for application in both current and net-zero structures.

Dr. Domanski is an ASHRAE Fellow and the IIR Honorary President of the Science and Technology Council. He holds a M.S. degree from the Gdansk University of Technology, Gdansk, Poland, and Ph.D. degree from the Catholic University of America, Washington, DC, USA.



HFO and low GWP blends in high temperature heat pumps

——Dr. Adrian Mota-Babiloni, Universidad Jaume I, Spain

Adrián Mota Babiloni is a Postdoctoral Researcher at the Department of Mechanical Engineering and Construction, Universitat Jaume I. Dr Mota-Babiloni finished a PhD in Engineering and Industrial Production from the Universitat Politècnica de València (UPV) in 2016.

His main line of research is low global warming potential (GWP) working fluids for refrigeration and air conditioning, ultralow-temperature refrigeration, organic Rankine cycles (ORC), and high-temperature heat pumps (HTHP) for industrial heat recovery.

Dr Mota-Babiloni has published 75 scientific papers in Q1 indexed journals and presented 85 at national and international conferences. To date, these publications have had an impact that is quantified in 2800 citations and an h-index of 34 in Scopus. The funding has been provided by 7 public R+D+i projects (1 co-PI) and 9 contracts with companies (2 PI). Additionally, 4 years (total of 1200 hours of collaboration with Rank ORC company for the development of ORC and HTHP equipment.

Dr Mota-Babiloni has participated in more than 260 reviews of articles in international journals, theses, books, and scientific projects and in various editorial bodies for indexed scientific journals.

Dr Mota-Babiloni has obtained the extraordinary award in the doctoral thesis, obtaining the best qualification in the engineering area of the UPV. Young Researcher Award in the Engineering and Architecture category of the Universidad Jaume I in 2018 and Award for Academic Performance in 2008/2009. My students have received a total of 5 awards in different categories.

Within the top2% cited in 2019 and 2020 in Energy according to Stanford University and included in 2021 in the ranking of the best national scientists according to the DIH Group.

Member of IIFIIR (Commission B1 and E2), KCORC; SECYTEF, EUREC, and Atecyr.



The options and development trend of alternative refrigerants in China during the implementation of the Montreal Protocol
——Ms. Xiaolin Guo, Foreign Environmental Cooperation Center of Ministry of Ecology and Environment, China

Guo Xiaolin, Deputy Director, Foreign Environmental Cooperation Center of Ministry of Ecology and Environment, China. Ms. Guo has been engaged in the implementation of the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol. Her main working fields include policy and strategy research, the implementation of ODS phase-out and HFCs reduction, research on environmental friendly alternatives, bilateral and multilateral international cooperation, etc. As a member of the Chinese government delegation, she has participated in the Conference of the Parties to the Convention and the Protocol, and the Executive Committee of the Multilateral Fund for many times, and undertook the negotiation of issues. She is the Chair of the Montreal Protocol Implementation Committee in 2022. She has in charge of the preparation and implementation of more than ten ODS phase out sector plans to promote the research and application of low-carbon alternative technologies in related industries.



Research on the thermophysical properties of the fourth-generation environmentally friendly refrigerant HFO: gaseous speed of sound and its general model
——Prof. Yuanyuan Duan, Tsinghua University, China

Yuanyuan Duan graduated from Tsinghua University in 1994 with a bachelor's degree in engineering and a bachelor's degree in economics. He also received his Ph.D. in Engineering Thermophysics from Tsinghua University in 1998. His doctoral research work was to measure the thermophysical properties of the new working fluids, difluoromethane and trifluoroiodomethane, including vapor pressure, PVT properties, speed of sound, surface tension, viscosity and thermal conductivity, and established the equations of state and theoretical models of thermophysical properties. He also won the National Excellent Doctoral Dissertation in 2000. He has been a Lecturer at Tsinghua University since 1998, and was promoted to Associate Professor in 2000 and Full Professor in 2003. His research interests include thermodynamics and thermophysical properties of fluids, energy system analysis, heat and mass transfer, and wetting dynamics, and he has published more than 400 peer-reviewed papers. He is a recipient of the National Science Fund for Distinguished Young Scholars, and has successively won the first prize of the National Science and Technology Progress Award, the second prize of the National Technology Invention Award, the first prize of the Natural Science Award of Chinese Universities, the second prize of the Ministry of Education Science and Technology Progress Award, and the second prize of Guangdong Province Science and Technology Progress Award and other academic awards, and was selected as "Elsevier China Highly Cited Scholar". He also serves as a director of the Chinese Society of Engineering Thermophysics, a director of the Chinese Higher Education Society, and a director of the Chinese Society For Measurement. In 2019, he won the New Century Teaching Achievement Award of Tsinghua University.



Low GWP Refrigerants to support Transition to Sustainable Cooling Technologies
——Mr. Ryan Hulse, Sr Research & Development Director for Honeywell Advanced Materials, USA

Ryan Hulse has spent his 19 years at Honeywell developing and launching new low global warming potential products. Ryan has worked on projects from industrial chillers to precision cleaning with NASA to hair styling products. Each product has presented a new set of challenges and opportunities with development partners, regulators, and end users across the globe. A key responsibility in this role is to work with customers to identify and qualify processes for the newly developed low global warming potential fluids. During his time at Honeywell, Ryan has directed efforts in new product discovery, led the solvent and Aerosol teams, directed physical property evaluations, and led the new applications groups. Ryan has been involved in a variety of new product launches in areas of propellants, solvents, refrigerants and blowing agents, which has resulted in more than 70 patents.

Ryan earned his Bachelor of Science and Ph.D. in Chemical Engineering from Brigham Young University.
