

INDUSTRIAL PROGRESS: A NEW GENERATION OF COMMERCIALY AVAILABLE WORKING FLUIDS FOR ABSORPTION CHILLERS AND HEAT PUMPS

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Abstract:

Energy efficient, sustainable technologies for cooling and heating represent major pillars of the megatrends resource efficiency and technology globalization. Driving cooling and heating cycles using renewable energies or waste heat rather than conventionally generated electricity contributes to address issues like industrial or comfort cooling with a substantially reduced carbon footprint. In this context, absorption chillers or heat pumps represent a promising technology.

One of the most prominent areas in which these absorption systems are applied is the generation of chilled water for air-conditioning by LiBr/H₂O-driven absorption chillers. In this context, the development has led from single-effect to double-effect systems and from steam-fired to direct-fired generators. The main freedom in designing and improving these kinds of cooling processes corresponds to the choice of the working pair and to the principle of multistaging. However, working pair related drawbacks such as crystallization, corrosion, instability or toxicity limit the market penetration.

In this presentation the potential of ionic liquids for absorption chillers will be evaluated from an industrial perspective. New results are presented demonstrating that customized ionic liquid based absorbents can overcome a number of state-of-the-art drawbacks, promoting new and/or improved cooling and heating processes.