Absorption Refrigeration: Review of the Technology and Future Prospects

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In the air-conditioning and refrigeration markets, heat-driven absorption chillers have been less popular than their electricity-powered vapor-compression counterparts primarily because of the higher capital costs and lower energy efficiency of the absorption systems. However, absorption chillers can become more attractive when factors such as total energy utilization, electricity demand-side management, and depletion of the ozone layer are to be considered. Absorption chillers also have the potential of employing waste heat as driving energy to produce chilled water for building cooling, thus improving the total energy utilization. The demand on electricity in industrial facilities as well as residential and commercial buildings has grown dramatically in the last two decades. Many power companies in some countries or areas with hot and humid climates experience an increasing demand during summer peak periods. The demand for building cooling is a major contributor to creating these peaks. Using demand-side management to lessen the demand for cooling is a more economical way of dealing with these peaks than constructing new power plants. Application of heat-driven absorption chillers is one effective way to reduce peak demand for air-conditioning usage. This presentation will review the state-of-the-art of absorption refrigeration technology and its future in the air conditioning and refrigeration markets.