Thermodynamical and Technical Problems in Solar Adsorption

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The energetic and volumetric performances of solar absorption refrigeration machines depend on the first hand on the equilibrium properties of the absorbent-refrigerant pairs. The working conditions always extend over a large zone of concentration up to the vicinity of saturation limit leaving therefore the domain of validity of the majority of the theoretical equations.

The choice of refrigerants leads to a classification of the systems according to the working pressure, under vacuum for water and methanol for instance and largely above atmospheric pressure for ammonia and derivatives, strongly influencing solar construction and general design of the system.

On the basis of heat and mass transfer irreversibilities, possible explanations for frequently observed discrepancies between calculated and measured performances are presented.

Attempts to predict the future of solar absorption refrigeration are made.