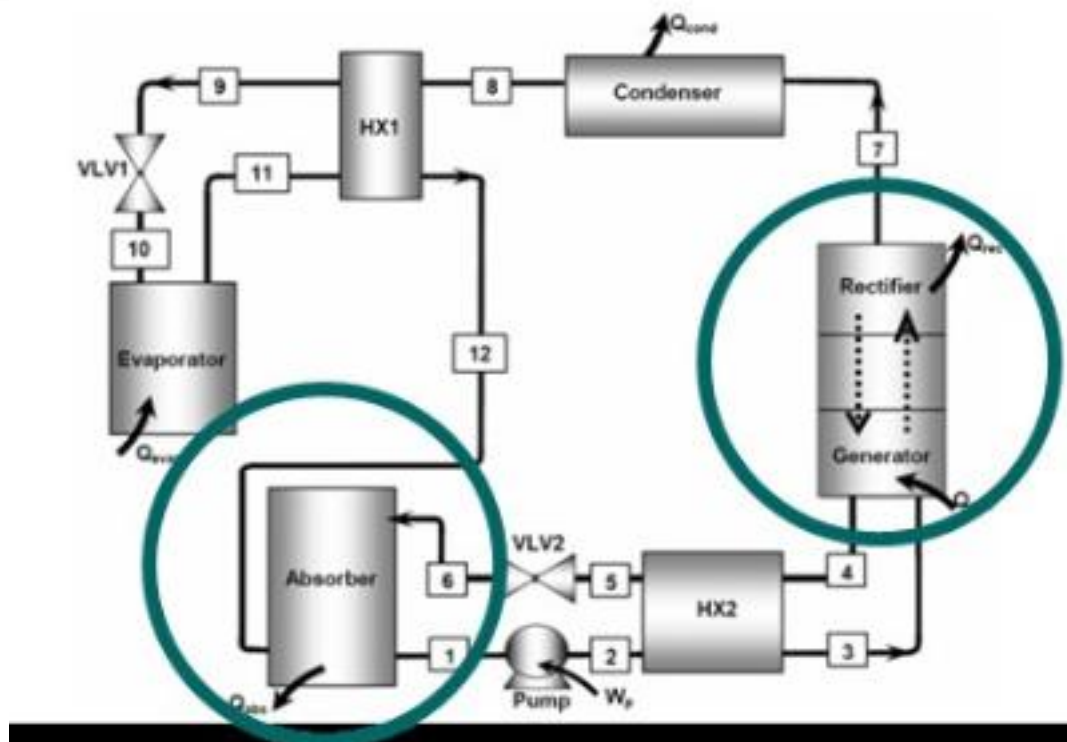


# Functional analysis of absorption and absorption-diffusion refrigeration systems

One of the objectives of this study is to examine the thermodynamic feasibility of absorption and diffusion-absorption cycles (using hydrogen as an inert gas) when alkane mixtures are used as working fluids. Both cooling modes, air and water, are considered. In the context of solar cooling, motive heat does not exceed a maximum temperature of 130 °C.



Functional analysis of a system

The performance of absorption and diffusion-absorption systems using the alkane mixtures selected following the preliminary study are then analyzed in greater detail using flowsheet tools: in the case of water cooling, the best performances are obtained with systems using the binary  $C\#H\# / n-C\#H\#\#$  (coefficient of performance of the order of 0.51 within the temperature range of the motive heat [110-125#]); when this same mixture is combined with hydrogen, a COP of the order of 0.44 can be obtained using an absorption-diffusion system with a motive temperature not exceeding 120#. Based on this study, we were also able to accurately model (full transfer model) the absorber of these systems.