THE UTILIZATION OF ABSORPTION COOLING INSTALLATION FOR INDIVIDUAL HOUSING PARTIAL OF FREE ENERGY CONSUMPTION

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Abstract: The *paper presents the utilization of absorption cooling installation and heat pumps for the achievement of thermal comfort. The primary source for this installation is the solar energy stored into a paraffin accumulator.*

Key Words: *Absorption cooling installation, Heat pump, Paraffin*

1. IINTRODUCTION

The reconsideration of utility of absorption cooling installation and heating pump, in the present energetic context, but especially in the future, become a very good idea.

We predicate this thing because the technological process and the new price of conventional source of energy list give back to them many new tides of usage.

Of course, the usage of this installations at present, is economically justified only in certain conditions of location and utilization

Before we say that, the building must be design as a set of systems which give us possibility to save daily the energy.

So, this type of project, become profitable mostly in geographical areas with warm desert climate (40 Celsius degrees during the day and 0 Celsius degrees during the night) and where the access at conventional source of energy (electricity, natural gas etc.) is difficult, expensive or is missing.

It is also interesting to place this kind of installations in areas with temperate continental climate considering the changes of present climate.

2. DESCRIPTION

At the same time, the evacuated heat by the cycle of absorption cooling installation is not drained off in the environment but is stocked in a paraffin accumulator.

These quantities of heat will be used for preheating of domestic water.

1. In the hot days the absorption refrigerating installation use the solar energy in order to function and cooling the indoors air through it's evaporator placed in ceiling.

   The heat evacuated by the installation condenser is stocked in a paraffin accumulator placed at superior level.

   The heat evacuated by the absorber will be stocked in accumulator in order to heat manage water.

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2. In case of absorption heating pump, the condenser will heat the room (40% from the heat produced by cycle) being located in superior part of the room (similar with a radiant low temperature floor).
   The circuit of the absorber is giving up about 60% of the produced heat by cycle and it must be placed at the inferior part of the room. The evaporator of heat pump is placed in a heat accumulator with paraffin (in the wall) and is taking back in to the cycle the necessarily energy.

   It must be mention that the position in vertical plan of absorption installation constituent parts is very important and it must be rigorous respected for the perfect function.

   This type of installations is designed making allowances of building characteristics and energetically means (solar energy, temperature level, etc.).

   For a safety function it is recommended to introduce in the circuit a super heater (after generator) with a conventional source of energy (gas or electricity) controlled by an ambient thermostat. This measure is absolutely necessary because in practice is possible to show up situations of equalize the temperatures of the generator and the condenser (in this case the function it will be stopped)

   The main parts of a frigorific absorbtion machine are presented in Figure 1:

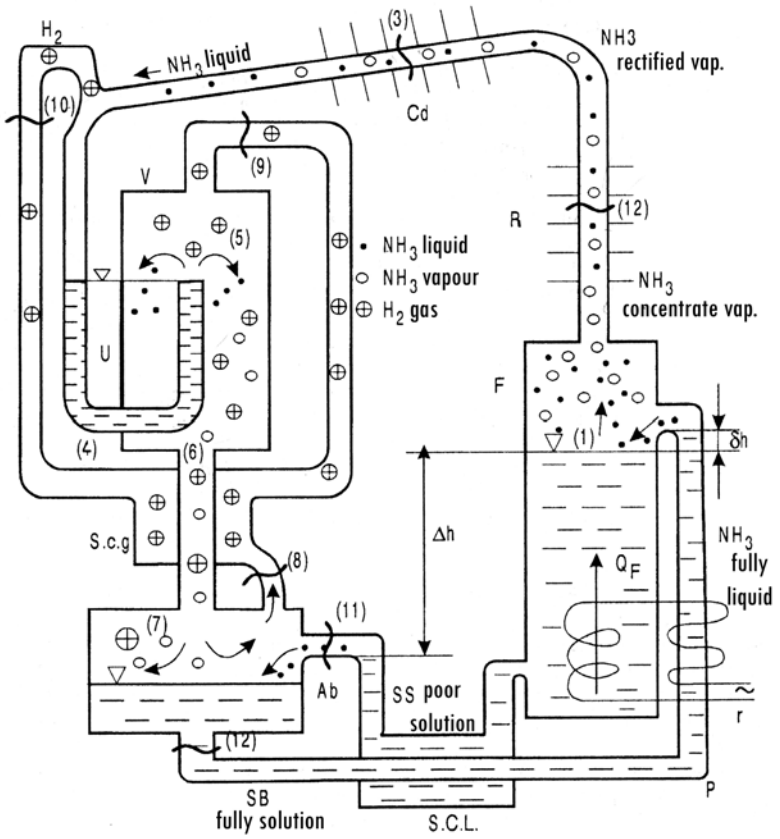

Figure 1 – Frigorific absorption machine and compensatory gas
F – Boiler; R – Rectifier; Ab – Absorber; Sc.g – gas-vapour heat exchanger
Sc.l–liquid-liquid heat exchanger; P–Pump; r–Heating thermal resistance; U-"U" tube

The positions of the compounding elements of a frigorific machine are presented in Figure 2:

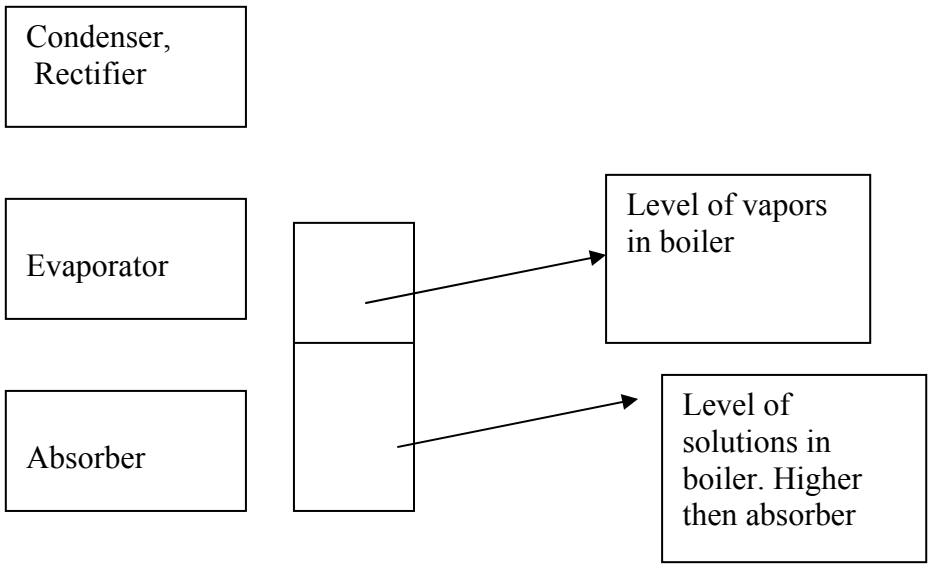

Figure 2 – Positions of the elements in the frigorific machine

The frigorific efficiency is less then 1
The positions of the elements in this machine are very important because of gravitational flow of some fluids.

The device equation is:

$$Q_0 + Q_f = Q_c + Q_a$$

Where:
Q_0 Heat absorbed by evaporator
Q_f Heat absorbed by boiler
Q_c Heat released by Condenser and Rectifier
Q_a Heat released by Absorber

This device receives heat at Evaporator and Boiler and release at Condenser-Rectifier and Absorber.

The heat released by Absorber is higher then the heat released by Condenser. The ratio is usually 40-60 %.

The frigorific efficiency is somewhere around 0, 7.

3. CONCLUSIONS

In the energetically balance of the building and from the point of view of expenses this small energy consume is entire justified.

In isolated locations (without conventional source of energy) but with large availability of solar energy (with a large number of sunny hours and height level of temperature during the day) the absorption refrigerating installation are irreplaceable.

This type of installations can cool the air inside a residential room but also in refrigerating room (for aliments or for generate ice).

This last two specifications presume the utilizations of a solar panel catcher (to obtain more than 100 Celsius degrees) as heat source for the generator.

Because we don't have mobile parts and as we saw up to now the cost of energy is very small, the rate of liquidation become competitive, making very attractive de design and construction of this kind of building with a complex system of saving energy.

We make mention that in sunny days (from the cold season) we can used the energy given by the solar panel placed on the roof, energy that can be transported inside with an absorption heating pump (in this case we also use the super heater evaporator).

Using absorption cooling installation and heating pump we can reduce the energy consumption by the basic heating system of the house.