The Student Chapters of SPE/AAPG cordially invites you to the following event:

Research of Diffusion Absorption Cooling Systems Focusing on the Bubble Pump

Abstract

The bubble pump is the main part in diffusion absorption cooling systems where heating, pumping of the binary solution and the separation occurs (Fig. 1).
An experimental study investigated the possibility of increasing the bubble pump performance by using a set of parallel bubble pump lift tubes. A modular experimental continuous system was designed to characterize the performance of three parallel bubble pump lift tubes with an environmentally friendly binary solution of R134a-DMAC. The dependence of the number of bubble pump lift tubes and various operating conditions (i.e., refrigerant mass concentration and heat input) on the amount of the desorbed refrigerant was determined. The results showed that in comparison to a single lift tube, the use of two or three parallel lift tubes when the bubble pump was operated with optimum heat input could double or triple, correspondingly, the amount of desorbed refrigerant.
Also a theoretical model was developed for the bubble pump. Up to date the existing theoretical models of the bubble pump were initially developed for air lift pumps where neither heating nor separation occurs. Thus, the experimental results that were conducted for a bubble pump did not correlate well with the theoretical models. Empirical values were suggested in some of the models, however, their values varied from one system to another and could not be predicted analytically. In this work a modified model based on mass, energy, momentum and heat balances is presented. with the utilization of the drift flux model with laminar flow assumption is presented. In addition, for the first time the applied heat is expressed in the model. The suggested model fits better with the experimental results than the previous models.

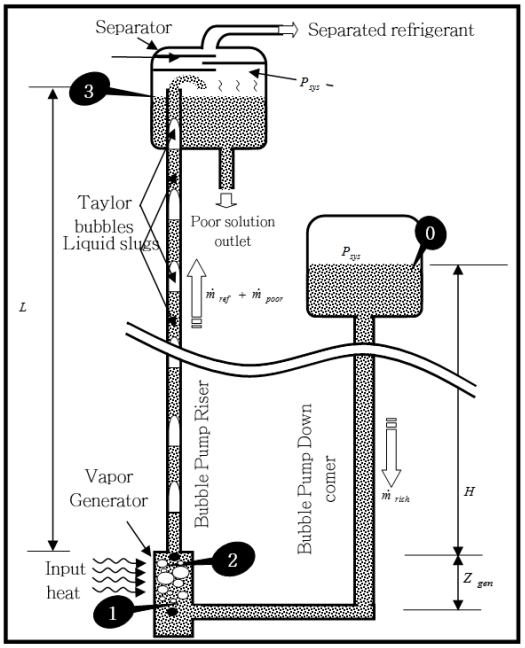

Fig. 1. Schematic drawing of the bubble pump.

Speaker's bio:

Dr. Bella Gurevich is a Lecturer and researcher in the Department of Engineering in Shamoon College of Engineering in Ashdod. She finished her Ph.D. studies in 2013 and was employed as an associate lecturer ever since. Bella's research concentrates on multiphase flow, solar cooling systems and thermodynamics of binary solutions.
Since 2017 Dr. Bella Gurevich is also the head of the Natural Gas Program for undergraduate mechanical engineering students.

Date: 28, June, 2018
Venue/Time: B1a, RTB; 12:00-12:45