

Non-Absorbable Gas Control in the Absorber/Evaporator in an Absorption Chiller Using a Immersed Plate

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Abstract

Two-dimensional numerical computations on vapor flow in the absorber/evaporator in an absorption chiller have been performed in order to investigate how to control the non-absorbable gas behavior. An immersed plate was inserted in the absorber/evaporator where 80 cylinders in the evaporator and 96 cylinders in the absorber were mounted. The length and the position of the immersed plate were changed in several steps. The mean concentration of non-absorbable gas ranged from 0 to 10vol%. Such geometric effects on the accumulating position of non-absorbable gas and heat transfer in the absorber were discussed based on the numerical results. The immersed plate inserted from the top wall between the absorber and the evaporator broke the high shear layer formed in the cases of no plate insertion. Then, the vapor flows from the bottom area or the side area into the absorber and pushes up the non-absorbable gas to the top area of the absorber. This causes keep the non-absorbable gas away from the penetration into the absorber. Some geometric cases were found to keep the high overall heat transfer coefficient until rather high concentration of non-absorbable gas.