



Figure 10: Comparison of the effect of circulation ratio values on absorber temperatures [8]

5. Conclusion

In the recent year's researcher's attention have been caught by absorption system due to its capability of using non-conventional energy resources. To improve its performance several efforts are being made to develop alternative refrigerant-absorbent pair. After studying three working pair name ammonia-water, ammonia-lithium nitrate and ammonia-sodium thiocyanate following conclusions are made:

- 1) Ammonia-water pair suitable where below 0°C temperature is required.
- 2) To get better performance of $\text{NH}_3\text{-H}_2\text{O}$ analyzer and rectifier is necessary, but by using alternative like $\text{NH}_3\text{-LiNO}_3$ and $\text{NH}_3\text{-NaSCN}$ there necessity can be omitted.
- 3) The performance graph of these cycles against various operating temperature shows that the performance of $\text{NH}_3\text{-NaSCN}$ and $\text{NH}_3\text{-LiNO}_3$ cycle are better than $\text{NH}_3\text{-H}_2\text{O}$.
- 4) Due to possibility of crystallization of $\text{NH}_3\text{-NaSCN}$, it cannot be operated at evaporator temperature below -10°C .
- 5) It was observed that at low generator temperature $\text{NH}_3\text{-LiNO}_3$ gives better performance than other two cycles, so if the low temperature heat source is used it is advisable to use $\text{NH}_3\text{-LiNO}_3$.

References

- [1] Eames I. W. Aphornratana, S. and Sun, Da-Wen, "Heat Recovery System & CHP", 1995, 15, 711-721.
- [2] Eames, Sun, Da-Wen, I. W. International journal of energy research 1996, 20, 871-885.
- [3] Sun, Da-Wen, Energy, 1996, 21(10), 919-929.
- [4] Sun, Da-Wen, Energy Sources, 1997, 19(4), 349-367.
- [5] Perez-Blanco H. "Absorption heat pump performance for different types of solution". Int J Ref 1984; 7(2):115-22.
- [6] C P Arora "Refrigeration and Air Conditioning". McGraw-Hill publication Second Edition. 2000, 1981, 427-437.
- [7] Marcriss RA, Gutraj JM, Zawacki TS. Absorption fluid data survey: final report on worldwide data, ORLN/sub/8447989/3, Inst. Gas Tech., 1988.

- [8] Da-Wen, Sun "Comparison of the Performance of $\text{NH}_3\text{-H}_2\text{O}$, $\text{NH}_3\text{-LiNO}_3$ and $\text{NH}_3\text{-NaSCN}$ Absorption Refrigeration System". PII: S0196-8904(97)00027-7.
- [9] Z. Crepinsek, D. Goricanec, J. Krope "Comparison of the performances of absorption refrigeration cycles" Smetanova ul. 17, 2000 Maribor, SLOVENIA.
- [10] Satish Raghuvanshi, Govind Maheshwari "Analysis of Ammonia -Water ($\text{NH}_3\text{-H}_2\text{O}$) Vapor Absorption Refrigeration System based on First Law of Thermodynamics" International Journal of Scientific & Engineering Research Volume 2, Issue 8, August-2011 1 ISSN 2229-5518.
- [11] Micallef, D. & Micallef, C. "Mathematical Model Of A Vapour Absorption Refrigeration Unit". Int j simul model 9(2010)2,86-97 ISSN 1726-4529.
- [12] Sachin Kaushik, Dr. S. Singh "Thermodynamic Analysis of Vapor Absorption Refrigeration System and Calculation of COP" IJRASET Vol. 2 Issue II, February 2014 ISSN: 2321-9653

Author Profile



Women.

Nisha sen has received the B.Tech degree in Mechanical from Dr. K. N Modi Institute of Engineering and Technology in 2013, now pursuing M.Tech in Mechanical & Automation Engineering from Indira Gandhi Delhi Technical University for



Women.

Dr. O. K. Singh has received his Ph.D. degree from IIT, Delhi for his research on Thermal Power Plants. He did his M.Tech. in Mechanical Engineering with specialization in Thermal Sciences with First Class (Honours) from Aligarh Muslim University (awarded

Gold Medal for securing First Position), Graduation Certificate in Marine Engineering with First Class with Distinction from Directorate of Marine Engineering Training (presently known as Marine Engineering & Research Institute), Bombay and B.Sc. Engineering (Mechanical) with First Class (Honours) from Regional Engineering College (presently known as National Institute of Technology), Calicut. He has about 13 years of teaching experience and serving in IGIT/IGDTUW since August, 2005. He has also served as a Marine Engineer in the past. He has contributed 8 research papers to the international journals of high repute. He is a life member of Indian Society for Technical Education.