THEORETICAL STUDY ON A MINIATURE JOULE-THOMSON & BERNOULLI CRYOCOOLER

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ABSTRACT

In this paper, a microchannel-based cryocooler consisting of a compressor, a recuperator and a cold heat exchanger has been developed to study the feasibility of cryogenic cooling by the use of Joule-Thomson effect and Bernoulli effect. A set of governing equations including Bernoulli equations and energy equations are introduced and the performance of the cooler is calculated. The influences of some working conditions and structure parameters on the performance of coolers are discussed in details.

REFERENCES

1. Kaiser G, ReiSig L, Thurk M, Seidel P, About a new type of closed cycle cryocooler operating by use of the Bernoulli effect. Cryogenics 1998;38(9):937-42.
2. Kakac S, Shah RK, Aung W. Handbook of single-phase convective heat transfer. New York: John Wiley & Sons; 1987.
3. Poling BE, Prausnitz JM, O'Connell JP. Properties of gases and liquids. 5th ed. New York: McGraw-Hill; 2000.
4. Haselden,G.G. Cryogenic Fundamentals, Academic Press, London, 1971.
5. Timmerhauss, K.D., *Cryogenic Process Engineering,* Plenum Press, 1989.