

[12] Pannock, J., Radermacher, R., Liu, Z., Yu, K. (1994). Evaluation of R134a and R152a as working fluids in a Domestic Refrigerator/ Freezer. ASHRAE Transactions, USA.

[13] Jung, D., Kim, C.B., Song, K., Park, B. (2000). Testing of Propane/isobutene mixture in domestic refrigerators. International Journal of Refrigeration, 23(7): 517-527. [https://doi.org/10.1016/S0140-7007\(99\)00084-5](https://doi.org/10.1016/S0140-7007(99)00084-5)

[14] Wongwises, S., Chimre, N. (2005). Experimental study of hydrocarbon mixtures to replace HFC-134a in a domestic refrigerator. Energy Conversion and Management, 46(1): 85-100. <https://doi.org/10.1016/j.enconman.2004.02.011>

[15] Tashtoush, B., Tahat, M., Shudeifat, M.A. (2002). Experimental study of new refrigerant mixtures to replace R12 in domestic refrigerators. Applied Thermal Engineering, 22(5): 495-506. [https://doi.org/10.1016/S1359-4311\(01\)00107-7](https://doi.org/10.1016/S1359-4311(01)00107-7)

[16] Sekhar, S.J., Lal, D.M. (2005). HFC134a/HC600a/HC290 mixture a retrofit for CFC12 systems. International Journal of Refrigeration, 28(5): 735-743. <https://doi.org/10.1016/j.ijrefrig.2004.12.005>

[17] Kuijpers, L.J.M., De Wit, J.A, Janssen, M.J.P. (1988). Possibilities for the replacement of CFC12 in domestic equipment. International Journal of Refrigeration, 11(4): 284-291. [https://doi.org/10.1016/0140-7007\(88\)90088-6](https://doi.org/10.1016/0140-7007(88)90088-6)

[18] Granryd, E. (2001). Hydrocarbons as refrigerants-an overview. International Journal of Refrigeration, 24(1): 15-24. [https://doi.org/10.1016/S0140-7007\(00\)00065-7](https://doi.org/10.1016/S0140-7007(00)00065-7)

[19] Saleh, B., Wendland, M. (2006). Screening of pure fluids as alternative refrigerants. International journal of Refrigeration, 29(2): 260-269. <https://doi.org/10.1016/j.ijrefrig.2005.05.009>

[20] Kyser, E.A. (1995). Precision total pressure measurements of propyne with propane, propene, and propadiene. J. Chem. Eng. Data, 40(4): 756-764. <https://doi.org/10.1021/je00020a007>

[21] Mathur, G.D. (1998). Heat transfer coefficients for propane, isobutane and 50/50 mixture of propane and isobutane. ASHRAE Transactions USA.

[22] Parashurama, S., Ramesha, D.K., Govindgowda, M.S. (2019). Screening of HFCs and fluoroethers as alternatives to R134a using SRK EoS. Journal of the Institution of Engineers (India): Series C, 1-7. <https://doi.org/10.1007/s40032-019-00501-5>

[23] Siddegowda, P. (2018). Development of alternative binary mixtures to replace HFC 134a in domestic refrigerator. Chemical Engineering Transactions, Adic.

[24] Reid, R., Prausnitz, J.M., Poling, J.M. (1987). The properties of gases and liquids. 4th edition, Mc.Graw Hill, New York.

[25] Calm, J.M., Hourahan, G.C. (2001). Refrigerant data summary. Engineered Systems, 18(11): 74-88.

[26] Jung, D. (2000). Testing of propane/isobutene mixture in domestic refrigerators. International Journal of Refrigeration, 23(7): 517-527.

[https://doi.org/10.1016/S0140-7007\(99\)00084-5](https://doi.org/10.1016/S0140-7007(99)00084-5)

[27] ASHRAE Handbook of Fundamentals. (1989). ASHRAE, Atalanta, USA.

[28] Babu, A.T.P. (1997). Theoretical and experimental investigation of alternatives to CFC12 in refrigerators. Ph.D Dissertation. Indian Institute of Technology, New Delhi, India.

NOMENCLATURE

C	Clearancefactor, Specific heat, kJ/kg°C
COP	Coefficient of Performance
h	Enthalpy, kJ/kg
M	Molecular weight, kg/kgmol
\dot{m}	Mass flow rate, kg/s
n	Polytropic index
P	Pressure, bar
Q ₀	Refrigerating Effect, KW
T	Temperature, K and Torque, N-m
v	Specific Volume, m ³ /kg
W	Power input, W

Abbreviations

N	RPM of the compressor
NBP	Normal Boiling point, °C
CFC	Chlorofluorocarbons
DME	Dimethyl ether
EOS	Equation of state
GWP	Global Warming Potential
HCs	Hydrocarbons
HFCs	Hydrofluorocarbons
HCFCs	Hydrochlorofluorocarbons
ODP	Ozone Depletion Potential
SRK	Soave-Redlick-Kong

Greek symbols

γ	Specific Heat ratio
η	Efficiency
μ	dynamic viscosity, kg. m ⁻¹ .s ⁻¹

Subscripts

c	Critical
fg	Vaporization
i	Inlet
is	Isentropic
k	Condenser
n	Polytropic
o	Starting Torque
0, 1, 2 etc.,	State Points
v	Volumetric Efficiency