Environmental Engineering and Management Journal

October 2010, Vol.9, No. 10, 1395-1400
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

THERMODYNAMIC STUDY OF R290 AND R600 BLENDS USED AS ECO-REFRIGERANTS

Horaţiu Pop[1], Gheorghe Popescu[1*], Michel Feidt[2], Traian Popescu[1], Valentin Apostol[1], Cătălina Adriana Marinescu[3]

[1]"Politehnica" University of Bucharest, Faculty of Mechanical Engineering and Mechatronics, Chair of Engineering Thermodynamics, 313 Splaiul Independentei Blvd., 77206 Bucharest, Romania
[2]University Henri Poincaré from Nancy, LEMTA, Polytechnic Institute of Lorena, Nancy, France
[3]Zecasin Research Institute, Ploiesti, Romania

Abstract

The present paper presents a new family of eco –refrigerants as an alternative solution for the replacement of pollutant refrigerants such as CFC's, HFC's and HCFC's. The family of eco – refrigerants proposed here is obtained by blending various hydrocarbons, namely R290 and R600. Being a blend of two natural substances without toxicity, the ODP is zero and the GWP is negligible, they are more environmental friendly, having improved thermodynamic properties compared to other refrigerants available in the market. Their good compatibility with the materials and lubrication oil of common vapor compression refrigeration systems (VCRS), make them a viable and advantageous solution to substitute nowadays HCFC's except the fact that this eco-refrigerants family has an increased risk of explosion and demands specific safety conditions. The use of this new family of eco–refrigerants, obtained by blending R290 and R600, in small scale VCRS dedicated to domestic, commercial or air conditioning applications is suggested.

Key words: thermodynamic study, vapor compression refrigeration systems, R290 and R600 blends as eco-refrigerants

Received: September, 2010; Revised: October, 2010; Accepted: October, 2010

[*]Author to whom all correspondence should be addressed: e-mail: popescu8m@yahoo.com; Phone: +40 723 416 580