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Analysis of Effectiveness of Eco-Friendly Refrigerant Combinations in a Domestic Air Conditioner System: A Review

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I. INTRODUCTION

It has become a worldwide concern that the role of refrigerants is considered as vital for their impact in the ozone layer depletion along with all other sources pertaining to global warming. Though the traditional refrigerants possess many desirable thermodynamic properties like higher energy efficiency, stability, flammability and non-toxic characteristics, the hazardous effects these refrigerants could cause on the stratospheric region and the consequent increase in the temperature of the earth have compelled the scientific community to find suitable eco-friendly alternatives to these toxic refrigerants. This problem requires urgent attention given its global proportions affecting lives of the people.

In Vapor Compression System (VCS), HCFC 22 is prominently used as working fluid in India. Due to its aggressive environmental effects like high Ozone Depleting Potential (ODP) and Global Warming Potential (GWP), the refrigerant will be phased out completely by the year 2020 in India according to Montreal and Kyoto Protocol. In developed countries, where such facilities were in use for many years now, HCFC 22 production has been limited and banned from use as working fluid in air conditioning systems. In order to solve the ill-effects caused by traditional refrigerants like ozone layer depletion and its associated problems, research works are carried out widely around the world to identify appropriate alternative refrigerant mixtures for application in residential air conditioners and heat pumps.

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