

بسم الله الرحمن الرحيم

قال تعالى :

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(صدق الله العظيم)

((سورة العلق الاية (1-5))

Dedication

To: my father.

To: my mother.

To: my brothers & Sister.

To: my family.

Acknowledgment

Thanks before and after to Allah for His giving me strength and powerful to complete this project.

I would like to express my great thanks to those who helped me to complete this thesis successfully:

- Staff of Refrigeration and Air conditioning works shop, Sudan University of Science and Technology.
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Abstract

This study has been carried out to determine the effect of refrigerants on ozone layer, global warming and resultant environmental effect.

Also the efforts exerted from international community and the Republic of the Sudan to solve this problem.

No doubt that phenomena of the ozone depletion and global warming causes hazardous effects on human being. From the begging of this century this phenomena has not been contend to conferences and lecture rooms , but become a day to day question that must be solved by earth citizens. Because it threaten the existence of human life on earth.

Causes of zone depletion and global warming phenomena are the bad uses to the natural resources, and the reduction of this phenomena will be implemented by reducing the emission of some gases to the atmosphere, like CO_2 , CH_4 , CFC .

This research will concentrate on the refrigerants effect.

Refer the program adopted by UN for the treatment of ozone depletion, which has been implemented in Sudan in conjunction with Sudan University of Science and Technology (Refrigeration and Air Conditioning workshop).

Training courses have been carried out on the field of new alternative refrigerant which has zero effect on ozone layer, these alternative refrigerants has negative effect to global warming

The result of this study , LPG has no effect on ozone layer and very small affection on global warming the experiment showed that , LPG give more cooling compared with (R-12, R-134a) and has low rate of power (about 10% less than R-12,R134) and has similar C.O.P.

From the above mentioned, the future researches must concentrate on HC refrigerants to avoid hazard effect on ozone layer and solving G.W.P Problems, resulting from using old refrigerants, which has negative effect on ozone layer and global warming .

Also attention must be given to the treatment adopting precautions, taken to save the world from disaster.

التجربة

هذه الدراسة أجريت لمعرفة مدى تأثير وسائط التبريد علي تآكل طبقة الأوزون والاحتراق

العالمي والآثار البيئية المترتبة علي ذلك، والجهود المبذولة من المجتمع

الدولي وجمهورية السودان لمعالجة هذه المشكلة .

لا يختلف اثنان علي أن ظاهرة تآكل طبقة الأوزون والاحتباس الحراري تشكل خطراً كبيراً علي الإنسان فمنذ بداية هذا القرن لم تقتصر هذه الظاهرة علي قاعات الدرس والمؤتمرات بل تعدتها لتصبح واقعاً معاشاً في كوكب الأرض يهدد حياة الانسان.

إن ظاهرة تآكل الأوزون والاحتباس الحراري جاء نتيجة لسوء استغلال الإنسان لموارد الأرض ، و إن تقليل تآكل طبقة الأوزون والاحتباس الحراري يتم بتقليل بعض الغازات المنطلقة الى الغلاف الجوي مثل CH_4 ، CO_2 ووسائط التبريد (CFC-HCFC-HFC) وغيرها من الغازات، ولكن في هذا البحث سنركز على تأثير سائط التبريد .

تم التطرق إلي البرامج التي وضعت بواسطة منظمة الأمم المتحدة لمعالجة تآكل طبقة الأوزون والتي تم تنفيذها في السودان انطلاقاً من جامعة السودان - كلية الهندسة - ورشة التبريد والتكييف لتدريب العاملين في مجال التبريد والتكييف لإحلال وسائط ليس لها تأثير علي طبقة الأوزون وإعادة تعبئة الغازات المستعملة وعدم اطلاقها في الغلاف الجوي، لكن اتضح إن هذه الوسائط البديلة لها تأثير علي الاحتراق الكوني فكان لابد من البحث مرة أخرى من وسائط ليس لها تأثير علي طبقة الأوزون و الاحتباس الحراري مع الاستمرار في هذا البرنامج .

لحل هذه المشكلة تم إتباع المنهج التجريبي علي ثلاثة أنواع من وسائط التبريد وهي:

- 1- (R-12-CFC) ذو التأثير السلبي علي طبقة الأوزون و الاحتباس الحراري .
 - 2- الوسيط الثاني هو (R-134a-HFC) الذي ليس له تأثير علي طبقة الأوزون وهو البديل المستعمل الآن للوسيط (R-12) ولكن تأثيره سلبي علي الاحتباس الحراري.
 - 3- الوسيط الثالث غاز (LPG) والذي ليس له تأثير علي طبقة الأوزون و الاحتباس الحراري.
- نتيجة التجارب أن غاز (LPG) الذي ليس له تأثير علي طبقة الأوزون و الاحتباس الحراري، يعطي تأثير تبريدي أفضل من (R134a- R12) ومعدل استهلاك قدره أقل بنحو 10% ومعدل أداء قريب من (R134a- R12).

مما سبق يجب أن نتجه البحوث نحو الهيدروكربون (HC) لتلافي المخاطر التي تهدد الوجود البشري نتيجة لاستعمال الوسائط ذات التأثير السلبي علي طبقة الأوزون و الاحتباس الحراري، والاهتمام بمعالجة مساوي HC المتمثلة في قابلية الانفجار بوضع الاحتياطات اللازمة، ولن تكون صعبة مقارنة بالفوائد المتحصل عليها وهي حماية كوكب الأرض من الدمار الذي سيلحق به نسبة لاستعمال وسائط التبريد المستعملة الآن.

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Abbreviations

R	Refrigerant
CFC	Chloro Fluorocarbon
HCFC	Hydro Chlorotluro Carbon
HFC	Hydrofuoro Carbon
LPG	Liquefied Petroleum Gas
HC	Hydro Carbon
UN	United Nations
C.O.P	Coefficient of Performance
UV	Ultra Violet Radiation
ODP	Ozone Depletion
GWP	Global Warming Potential
DU	Dobson Unit
RMR	Refrigerant Management Plan
R & R	Recovery and Recycling
ASHRAE	American Society Of Heating, Refrigeration and Air- Condition Engineers
UNFCCC	United Nations Frame Work Convention on Climate Change
IPPC	Inter government Panel on Climate Change
HVAC	Heating, Ventilation and Air Conditioning
RES	Renew able electricity standard
UN IDO	United Nations of Industrial Development Organization
NOU	National Organization Unit
Co ₂	Carbon Dixiod
CH ₄	Methane
MAC	Mobile Air Condition