VATIS Update Ozone Layer Protection . Sep-Oct 2007

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THE SCIENCE OF OZONE LAYER

Greenhouse gases could aggravate ozone loss and slow down recovery

Increased atmospheric concentrations of global warming greenhouse gases (GHGs) could lead to more severe loss in the polar regions of ozone, the naturally occurring gas that filters out cancer- and cataract-causing ultraviolet (UV) rays from the sun, according to the United Nations World Meteorological Organization (WMO). While increased GHGs will lead to a warmer climate at the Earths surface, same increase is likely to lead to a cooling of the atmosphere at the altitude where the ozone layer is found, WMO said in a paper marking the Montreal Protocols 20th anniversary. Lower temperatures enhance the chemical reactions that destroy ozone.

At the same time, the amount of water vapour in the stratosphere has been increasing at the rate of about 1 per cent per year. A wetter and colder stratosphere means more polar stratospheric clouds, which is likely to lead to more severe ozone loss in both polar regions. A cooling of the winter stratosphere over the last decades has indeed been observed, both in the Arctic and in the Antarctic, WMO noted, adding that these changes could delay the expected recovery of the ozone layer. The agency called on all nations with stratospheric measurement programmes to enhance them. It also urged funding agencies to support research on stratospheric ozone and harmful UV radiation.

Over the next 10 to 20 years, high-quality global observations of ozone and ozone-depleting substances will be particularly critical in verifying the effectiveness of actions taken under the Vienna Convention in 1985, the Montreal Protocol of 1987 and its amendments and adjustments, said Mr. Michel Jarraud, Secretary-General of WMO. As ozone-depleting substances reach a broad peak and slowly begin to decline, the search for recovery of ozone requires vigilance, Mr. Jarraud cautioned

Source: www.un.org

Ozone hole over Antarctic appears early in 2007

A hole in the ozone layer over Antarctica has appeared earlier than usual in 2007, the United Nations weather agency said on recently. The World Meteorological Organisation (WMO) said it would not be clear for several weeks whether the ozone hole, which is expected to continue growing until early October, would be larger than its record size in 2006.

While the use of ozone-depleting chlorofluorocarbons has waned, large amounts of chlorine and bromine remain in the atmosphere and would likely keep causing holes in the protective layer for years to come, WMO said. Although ozone-depleting substances are now declining slowly, there is no sign that the Antarctic ozone hole is getting smaller, it said in a report. The ozone hole may reach the southern tip of South America in 2007, according to Mr. Geir Braathen, a senior scientific officer with the WMOs atmospheric research and environment programme.

Source: www.reuters.uk.com

NASA will continue to keep an eye on ozone layer

Scientists at the National Aeronautics and Space Administration (NASA), the United States, will join researchers from around the world this September to celebrate the success of the Montreal Protocol. Space-based instruments aboard NASAs Aura satellite monitor the chemical make-up of the atmosphere and collect data that will help researchers better understand ozone chemistry through computer models. While the data show that average chlorine levels are declining, springtime ozone depletion in the polar regions continues to be a prominent atmospheric feature.

Data from past satellite observations have been key to understanding ozone depletion. NASAs Total Ozone Mapping Spectrometer (TOMS) was one of NASAs signature ozone research achievements. The TOMS images of the Antarctic ozone hole caused worldwide alarm and thus played a key role in the Montreal Protocol and other international agreements to phase out the offending chemicals from our environment, said Mr. Pawan Bhartia, at the Goddard Space Flight Centre.

In addition to the current satellite measurements, NASA research efforts use data collected on the ground, in the air and from previous missions. Scientists collect atmospheric composition data from ground-based monitoring stations around the world. Researchers have collected measurements since 1978 for compounds identified in the Montreal Protocol. The data come from coastal monitoring stations used in previous missions and as part of the NASA-sponsored Advanced Global Atmospheric Gases Experiment.

For researchers working to predict the future of the global ozone layer, all these measurements are important. The differences between loss and recovery of ozone at the poles and in non-polar regions are complex. The focus in ozone research has now shifted to include the effects of climate change. Twenty years ago we went out of our way to separate ozone depletion from climate change, said Ms. Ross Salawitch, an atmospheric chemist at the Jet Propulsion Laboratory, California. After a decade of looking at data, the community realizes they are linked in subtle but profoundly important ways.

Source: www.sciencedaily.com

ODS PHASE-OUT IN INDIA

Control targets of Montreal Protocol achieved

India has already achieved the control targets as per the Montreal Protocol, said Mr. Namo Narayan Meena, Minister of State for Environment and Forests, addressing the 19th Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone layer at Montreal, Canada. He said that production phase-out of

chlorofluorocarbons (CFCs) is progressing on schedule to meet the reduction targets under the Protocol, and India has phased out the use of CFCs in manufacturing aerosol products (excluding MDI), foam and all types of refrigeration equipment.

Giving additional details about the phase-out programme, Mr. Meena said India has ratified all the amendments to the Montreal Protocol. The country has a licensing regime for imports and exports of ozone depleting substances (ODS), he added. The National Regulatory Measures have been designed in a manner that encourages, through fiscal incentives, enterprises that use non-ODS-based technologies. As to the consumption of carbon tetrachloride and CFCs in the servicing sector, the Minister said that it is largely represented by small and micro enterprises, which provide livelihood to thousands of people.

With regard to freezing hydrochlorofluorocarbons (HCFCs) in 2016, Mr. Meena said that adequate funding for environment-safe substitutes and expeditious transfer of related technologies under fair and favourable conditions need to be ensured. This will assist developing countries in preparing strategies for taking action to meet the first target for HCFCs control measures under the Montreal Protocol.

Source: www.pib.nic.in

Anniversary of Montreal Protocol celebrated

On 16 September, India celebrated the thirteenth International Day for Preservation of the Ozone Layer to commemorate the date of signing of the Montreal Protocol on Substances that Deplete the Ozone Layer. The United Nations Environment Programme has declared Celebrating 20 Years of Progress of the Montreal Protocols goals as the theme for 2007, hailing the Protocol as the most successful international treaty to date.

Mr. Namo Narayan Meena, Minister of State for Environment and Forests, in a message said that India has emerged as a global leader in promoting smooth transition for phasing out ozone depleting substances (ODS). He expressed satisfaction at the honour of the country being bestowed the Montreal Protocol Implementers Award.

The chief guest Mr. Siddharth Behura, Special Secretary, the Ministry of Environment and Forests, administered the pledge to make efforts for preservation of ozone layer and promote use of ozone friendly goods and services. He credited the success of Indias ODS reduction to the cooperation and networking among different stakeholders, including producers and consumers of ODS, the state/central authorities, technical institutions, subject experts, NGOs and other organizations. Mr. Atul Bagai, Regional Co-ordinator of the United Nations Environment Programme, said that India played a great contribution in removing ODS.

Source: www.pib.nic.in

Air India receives Environmental Protection Award

The national carrier of India, Air India, has been awarded this years United Nations Environmental Protection Award. Air India is engaged in various environmental programmes including conservation of energy and other natural resources and hence the award came as a best recognition for its effort to global environment protection.
Air India has received the Montreal Protocol Public Awareness Award for its continuous endeavour in various programmes following the guidelines of the Ozone Action programme of the United Nations Environmental

Programme (UNEP). Air India, as one of the major international airlines, had participated in the UNEP Ozone Action Programme and is so far successful in limiting the use of chemicals in various fields. UNEP, in a long-term plan, had brought in all major airlines for an agreement of halon bank management to decrease the use ozone-depleting substances.

Source: www.newstrackindia.com

Delhi government to bring bill for checking ozone depletion

The Chief Minister of Delhi, Ms. Sheila Dikshit, has said that her government would either bring in legislation that would provide for putting Ozone Friendly Product stickers on most-used ozone-depleting goods or adopt a central legislation to this effect, to ensure protection of the ozone layer in the upper atmosphere.

Speaking at the inauguration of a seminar on Ozone Depleting Substances Phase-Out at Delhi Secretariat, Ms. Dikshit expressed pleasure at the fact that India would be receiving the Montreal Protocol Implementers Award on the occasion of 20th anniversary of the protocol. Since chlorofluorocarbons used in air-conditioning, refrigerators, aerosols and foam products deplete the ozone layer, she said it was essential to label stickers stating whether such goods are ozone-friendly products.

Source: www.hindu.com

CFC-free inhalers for asthma patients

After successfully phasing out ozone-depleting chlorofluorocarbons (CFCs) from refrigerators and air-conditioners, India is now moving on to environment-friendly inhalers, used by asthma and bronchitis patients. When the world agreed upon the Montreal Protocol, CFCs in asthma inhalers were the last ones left for phase-out, as these were considered essential drugs. Even as the world celebrates the International Ozone Day on September 16, pharma companies are introducing new technology in their inhalers which is CFC-free, and hence not harmful to ozone.

The new metered dose inhalers (MDI) use hydrofluoroalkanes (HFA) technology, which has been already been introduced in a range of inhalers by drug major Ranbaxy. The CFC-free inhalers cost 20 per cent more than the conventional ones. India, presently, has an estimated 15-20 million asthmatic patients and the estimated prevalence rate in 5-11 year old children is between 10-15 per cent.

Source: www.economictimes.indiatimes.com

Tata Motors opts for HFC refrigerant

The Chennai-based hydrofluorocarbons (HFC) company Refex Refrigerants will start supplies early next year to Tata Motors car plant in Pune. Refex will set up two 25-tonne storage tanks at the car manufacturers plant. Our gas will be used in majority of the air-conditioned cars rolled out of Tata Motors Pune plant, stated Mr. Anil Jain, managing director of Refex Refrigerants. Refex Refrigerants will install pipelines from the storage tanks up to the point inside the car plant where the air-conditioners are fitted. The Tata deal is the second such deal for Refex Refrigerants. Earlier the company had signed up with Hyundai Motor India to build another two 25-tonne capacity storage tanks at the automakers second plant, which will roll out 300,000 cars per year.

Refex Refrigerants will be the sole supplier for Hyundai Motors second plant and the revenue potential is around Rs 125 million per year, says Mr. Jain.

Source: www.domain-b.com

Air India mulls green drive forum to save ozone layer

After bagging the Montreal Protocol Public Awareness Award, instituted by the United Nations, for its efforts in protecting the ozone layer, Air India is planning to rope in other airlines into its environment-friendly drive, under the umbrella Airlines Forum for Environment Protection. According to Mr. K.M. Unni, convener of the environmental committee, Air India, the idea to form a forum to protect the depleting ozone layers came up during Air Indias meetings with international agencies like the United Nations Environment Programme and the Global Reporting Initiative.

Mr. Unni says the immediate issue is that the 2 per cent carbon dioxide emission contribution of the aviation sector may increase enormously by the phenomenal increase in air travel and acceptance of air travel as common mans transport. With the increased activities in general and civil aviation and the stringent rules on emission and noise pollution activities, airlines across the globe have started adopting measures to curb the adverse effects on the environment.

Source: www.financialexpress.com

IN THE NEWS

Agreement to speed up greenhouse gas phase-out

Governments of almost 200 countries have agreed to accelerate the elimination of hydrochlorofluorocarbons (HCFCs), a major group of greenhouse gases that depletes ozone. The agreement will speed up a treaty to freeze and phase out HCFCs, which are used in some refrigerators, home appliances, hair sprays and air-conditioners, said Mr. Nick Nuttall, spokesman for the United Nations Environment Programme. With this plan of an accelerated freeze and accelerated phase-out, we could have potentially significant benefits arising in terms of combating climate change and ozone loss, Mr. Nuttall said.

Developed countries have agreed to reduce production and consumption by 75 per cent by 2010 and by 90 per cent by 2015 with final phase out in 2020 10 years sooner than the earlier agreement. Developing countries have agreed to cut production and consumption by 10 per cent in 2015, by 35 per cent by 2020 and by 67.5 per cent by 2025 with a final phase-out in 2030. The governments also agreed to commission a short study by experts to fully assess the likely costs of the acceleration.

United Nations climate experts said in a recent report that the atmosphere could be spared the equivalent of 1 billion tonnes of carbon dioxide emissions if countries used ammonia, hydrocarbons, carbon dioxide or other such ozone-friendly chemicals, rather than HCFCs and hydrofluorocarbons (HFCs), in foams and refrigerants.

Source: www.ap.google.com

United Nations chief lauds push to hasten HCFC phase-out

Secretary-General of the United Nations, Mr. Ban Ki-moon, has welcomed the recent agreement by the signatories to the Montreal Protocol to accelerate the freeze and phase-out of hydrochlorofluorocarbons (HCFCs), a class of chemical compounds that hastens ozone layer damage and climate change. Participating countries, meeting to celebrate the 20th anniversary of the Protocol, signed up to halt the production of HCFCs in 2013 and push forward their elimination by ten years. The acceleration may also assist in restoring the health of the ozone layer by several years. HCFCs emerged as replacement chemicals in the 1990s for air-conditioning, some forms of refrigeration equipment and foams, following an earlier decision to eliminate chlorofluorocarbons that damage ozone more.

Mr. Ban stressed that global efforts to protect the ozone layer and to address climate change are mutually supportive. He also pointed out that the new agreement includes a commitment to sufficiently fund the strategy of phasing out HCFCs, and voiced hope that Member States will tackle the issue of greenhouse gas emissions with the same urgency and boldness.

In a related development, the Secretary-General also said that time is running out in halting climate change, which he has identified as one of his top priorities. We must begin to attack the problem right now, he wrote in an op-ed published in some newspapers such as the Italian newspaper Il Sole 24 Ore. While industrialized countries responsible for creating a bulk of the problem have the greatest responsibility to reduce emissions, developing countries must be encouraged to join the effort while simultaneously stimulating their economic activity and wiping out poverty, he said. Decisive action is crucial, and business as usual will not do, he stated.

Source: www.un.org

Call in Bangladesh to phase out ODS by 2010

The International Ozone Day was observed in Bangladesh, laying emphasis on phasing-out of ozone depleting substances (ODS) by December 2010, a universal timeframe under the Montreal Protocol. Bangladesh, a signatory to the Montreal Protocol, has been observing the day since 1995.

Speaking at a seminar arranged on this occasion in the city, experts called for sensitizing the common people about the harm that ODS cause to ozone layer. They urged the government to take steps for the recovery of chlorofluorocarbons used in the refrigerators and air-conditioners and for strengthening the on-going training programme for technicians of the chilling sector as well as distributing more recovery kits to stop release of the gases in the air.

Source: www.thedailystar.net

Sri Lankan government assists CFC conversion

In Sri Lanka, the National Ozone Unit of the Ministry of Environment and Natural Resources has launched a project to encourage the conversion of CFC refrigeration to non-CFC as a measure to protect the ozone layer. Industrial and commercial R 12 and R 502 refrigerators can be converted to non-CFC under the programme.

Food and beverages stores, fish and meat shops, hospitals, hotels and canteens, super markets and freezer transport sectors can apply for the concessions. However, domestic refrigerators and air-conditioners, are not eligible for the grants. Sri Lanka has banned importing CFC freezers from 2008 January.

Source: www.colombopage.com

Indonesia to stop importing CFC next year

Indonesia will stop importing chlorofluorocarbons (CFCs) and methyl bromide for non-quarantine and shipment activities from next year, an environmental official said. Indonesia has gradually stopped importing ozone depleting substances since 1998, said Ms. Kusmuliani, from the office of the Environment Minister, during a workshop on the reduction of CFCs use.

She said that Indonesias import of the three types of the ozone depleting substances (ODS) had continued to be reduced since 1998. In 2004, Indonesia imported 5,546 tonnes of ODS. The figure drastically dropped to not more than 1,122 tonnes in 2007. Beginning next year, Indonesia will stop importing the substances, particularly for non-quarantine purposes, Ms. Kusmuliani said.

This, however, does not mean that the countrys import of ODS will be nil because it still has to buy them for quarantine and shipment purposes, Ms. Kusmuliani added. She said the substances were needed, among others, to clean pests in quarantine warehouses and shipment. Since early 2007, Indonesia has imported 22 tonnes of ODS for these purposes. The country belongs to the group of countries that consume a small volume of ozone depleting substances, namely about 0.3 kg per capita per year.

Source: www.antara.co.id

Viet Nam delivers on Montreal Protocol

Viet Nam has been effective in implementing the Montreal Protocol on ozone-depleting substances, said an official from the Ministry of Natural Resources and Environment (MoNRE). According to Mr. Nguyen Khac Hieu, Vice Director of the Department of International Relations, a decree has been issued forbidding the import of freezing equipment that use chlorofluorocarbons (CFCs). MoNRE has also issued, jointly with the Ministry of Industry and Trade, a circular to control import and export of ozone depleting substances (ODS).

To help Viet Nam effectively implement the provisions of the Montreal Protocol, the Multilateral Fund provided a grant of US$6.3 million last year to transfer technology to local businesses, which use ODS in the production and repair of refrigerators and car air-conditioners. The Fund also provided technical assistance to help improve management capacity of state agencies in controlling these substances.

Viet Nam also worked out a plan of action that focuses on setting up units to collect and recycle halons, regularly monitor the use of CFCs in car air-conditioners and provide technical equipment for businesses that manufacture products using ODS. Thanks to these efforts, the total volume of ODS, such as CFC-11 and CFC-12, used in the country reduced to 75 tonnes at present from 500 tonnes in the 1990s. The combined amount of other ODS now stands at some 2,300 tonnes.

Source: www.english.vietnamnet.vn

Thailand commits to zero imports of CFCs by 2010

Thailand will comply with an international ban on imports of ozone-depleting chlorofluorocarbons (CFCs) by 2010, according to the state-run Thai News Agency (TNA). The Department of Industrial Works (DIW) has committed itself to the zero-import target as part of activities marking the International Ozone Day, the report said.

CFC use has been phased out worldwide and by Thailand-based manufacturers by turning to alternative chemicals. The ozone layer has recovered to some degree after several countries have reduced use of ozone-depleting chemicals by 95 per cent, or 1.8 million tonnes, equal to the decrease of 25 billion tonnes of carbon dioxide, which can help slow down the global warming for about 10 years, said Mr. Adisorn Naphavaranonth, the DDG of DIW.

Source: www.earthtimes.org

Joint ventures in refrigerant fluids target Asia-Pacific

Arkema, France, has announced the creation of two joint ventures in partnership with Daikin, Japan one for the production of HFC-125 in China and the other for marketing refrigerant fluid blends in the Asia-Pacific region. The expertise of both companies in the production and blending of hydrofluorocarbons together with their overall market position establish this partnership as the leader for refrigerant fluids in the Asia-Pacific region.

Arkema Daikin Fluorochemicals Co. Ltd., a 60 per cent Arkema and 40 per cent Daikin joint venture, is to focus on the production and marketing of HFC-125, an essential component of the new generation refrigerant blends, which include the R-410A blend due to replace HCFC-22. Arkema will provide its process and technological expertise for the design and construction of the plant, which will be located on its Changshu site. This large-scale plant, the first of this size in Asia, will come on stream in 2010. Daikin Arkema Refrigerants Asia Ltd., a 60 per cent Daikin and 40 per cent Arkema joint venture, will produce and market new-generation HFC refrigerant fluid blends, in particular the R-410A blend, in the Asia-Pacific region.

Source: www.home.businesswire.com

REFRIGRATION/AIR-CONDITIONING

Eco-friendly air-conditioner

A team of scientists in the Republic of Korea has developed air-conditioning technology that doesnt involve chemical compounds believed to cause global warming. The team, headed by Prof. Vahc Young-woo at Yonsei University, has developed a prototype of the environmentally friendly air-conditioner, designed to generate a refrigeration cycle without having to depend on widely used refrigerants such as Freon, widely thought to be sharing some of the responsibility for global warming. It also doesnt need the huge external section that is typically installed on apartment balconies.

This is not the first time that scientists have unveiled a Freon-less air-conditioner. However, such models had failed to measure up to the functionality of existing products. By contrast, Prof. Vahcs team demonstrated that the prototype can produce a temperature drop from 26C to 16C in just three minutes. Another advantage of the

new system is that its electricity consumption is almost the same as traditional air-conditioners, Prof. Vahc said.

Source: www.koreatimes.co.kr

Freezing technology based on carbon dioxide

Starfrost Ltd., the United Kingdom, has developed a revolutionary freezing system for seafood products that could only be processed earlier using nitrogen. Starfrosts equipment development team has pioneered two types of freezing system using carbon dioxide (CO2) technology. Both systems offer an alternative freezing solution for seafood, such as shrimp, once viewed as a nitrogen only product. Both these non-cryogenic mechanical systems operate at temperatures lower than the traditional -32C freezers. The CO2 systems offer food processors an environment-friendly, nitrogen-free solution, with low running costs.

Starfrost has developed a low-temperature, high-velocity impingement tunnel freezer using CO2 technology, as well as a contact freezing system. The contact freezer features an overhead air system, with the product placed in contact with a smooth metal plate containing refrigerated pipes. Tests have shown that soft and wet seafood products, such as scallops, are highly suited to the contact systems rapid freezing process, which leaves no belt-marks.

Our low temperature, high velocity CO2 system can easily match the quality results of nitrogen, without the use of ammonia in the factory space. Our product trials have even shown a better distribution of freezing across the entire product, says Starfrost Director Mr. Dave Pearson.

Contact: Starfrost (UK) Ltd., Starfrost House, Newcombe Road, Lowestoft, Suffolk, NR32 1XA, United Kingdom. Tel: +44 (1502) 562 206; Fax: +44 (1502) 584 104

E-mail: sales@starfrost.co.uk

Source: www.foodprocessing-technology.com

CO2 air-conditioning system

Visteon Corp., the United States, has been testing its new air-conditioning system that uses carbon dioxide (CO2) as the working fluid on a fleet of demonstration vehicles from more than a dozen manufacturers. The company says that because of the high-pressure, CO2-based refrigerant R744 is more thermodynamically efficient than the R134a refrigerant currently used by most light vehicles, and less power is required from the engine to operate the A/C system. The company says tests have demonstrated the new R744-based system, which is now production-ready, can reduce the fuel used by the A/C system by a quarter.

R134a refrigerant is a hydrofluorocarbon that is many times more potentially damaging to the atmosphere than CO2. The average automotive HVAC system contains about 680 g of R134a. Visteon says every 1,000 g of R134a released into the atmosphere is the equivalent of 1,300 kg of CO2.

The new R744 systems can employ an integrated heat pump that delivers supplemental cabin heat almost

instantaneously in very cold temperatures, thus improving passenger comfort. The immediate supply of warm air also allows rapid windshield defrosting. Because of its low drag on the engine, the new CO2-based HVAC system also can be a boon for hybrid and mild-hybrid vehicles.

Source: www.edmunds.com

Eco-friendly refrigerants

Refrigerant Products, the United Kingdom, has developed non-ozone-depleting refrigerants, which are non-toxic, energy-efficient and compatible with traditional lubricants. These environment-friendly refrigerants offer significant cost savings by avoiding expensive retrofits of refrigeration and air-conditioning equipment. The companys replacements for ODS have gained regulatory and safety approvals in the United Kingdom and the Environmental Protection Agency in the United States.

Contact: Refrigerant Products Ltd., N9 Central Park Estate, Westinghouse Road, Trafford Park, Manchester M17 1PG, United Kingdom. Tel: +44 (161) 877 3030; Fax: +44 (161) 877 2525.

Source: www.dti.gov.uk

HFC refrigerants for centrifugal chillers

AlliedSignal Inc., the United States, has secured a patent on certain hydrofluorocarbons (HFCs) useful in refrigeration and heat pump applications. The invention provides hydrofluorocarbons selected from the group of 1,1,2,3,3-pentafluoropro-pane (HFC-245eb), 1,1,1,3,3-pentafluoropropane (HFC- 245fa), 1,1,1,2,3-pentafluoropropane (HFC-245ea), and their mixtures that are said to be environmentally safe replacements for chlorofluorocarbons in refrigeration applications such as multi-stage centrifugal chillers.

The invention claims that that these compounds meet the need for a non-inflammable refrigerant, which has a low ozone depletion potential and is a negligible contributor to global warming com-pared with currently used refrigerants, such as R-11 and 123. These compounds and mixtures also have COPs and capacities that render them suitable for use in refrigeration applications, such as in centrifugal chillers. They exhibit very low compressor discharge temperatures.

Source: www.freepatentsonline.com

Large R744 refrigeration systems

The Swedish manufacturer Green & Cool has introduced a broad range of ready-to go carbon dioxide (R744) refrigeration units, after their successful run in supermarkets of Swedens largest food retailers. The models Pacific HT, and Mistral HT, MT and LT cover all temperature applications, featuring a noise-reduced reliable operation under all conditions. All models have the options of superheat exchanger, anti-vibration mounts,

flexible sleeves on the evaporator and the condenser sides, as well as the heat exchanger, and extra liquid receiver (62 litres).

The Mistral models are chiller/freezer units with direct expansion on the evaporator, gas cooler/and condenser side. It is available in 13 capacities as an air-conditioner for high temperature (HT) range, chiller for the medium temperature (MT) range, and a low temperature (LT) freezer unit. Depending on the application, these models will achieve a refrigeration output of 15 kW to 120 kW, operating with evaporation temperatures of -37C to -10C. Pacific HT is a liquid chiller unit with a liquid- cooled gas cooler/condenser and is meant for high-temperature range. The unit is available in five capacities with refrigeration outputs of 40 kW to 200 kW.

Source: www.r744.com

Long-term tests prove high R744 efficiency

A study by the Austrian research centre Das Virtuelle Fahrzeug Forschungsgesellschaft (VIF) found there is still potential for improving already efficient R744 car air-conditioning and heating if new simulation models and testing methods are applied. VIFs Virtual Vehicle project focused on: the verification of component models for R744 air-conditioning and heating systems; analysis of the cooling and heating mode on the overall vehicle performance; and comparison of different heating options.

Tests showed that even at a high ambient temperature of 40C and a relatively low compressor speed of 600 rpm, an R744-based air-conditioning system could achieve a cooling performance of 4 kW and a maximum COP of 3.0. At an ambient temperature of 20C, the COP will even be at 4.2. Using a coolant/air heat pump (HPCA) will lead to a heating performance of 5 kW and a COP of 2.5 at an ambient temperature of -5C and a compressor speed of 1,400 rpm. The HPCA is hence the preferred option for R744 heating systems compared with an air/air heat pump or a hot gas cycle.

Source: www.r744.com

AEROSOLS

Blowing agent blends

Atofina Chemicals Inc., the United States, has been assigned a patent on foam blowing agent blends of trans-1,2-dichloroethylene (Trans 12) and one or more pentanes, and on polyol premixes and foam compositions containing such blends. The foam-blowing agent compositions comprise Trans 12 and one or more pentanes selected from the group consisting of n-C5, i-C5 and c-C5 (preferably c-C5).

Such blends dramatically improve fire resistance and the initial K factor (thermal conductivity) of pentane-blown foams. These blends are particularly useful for making closed cell polymer (insulation) foams, such as polystyrene, phenolic and polyurethane foams.

In the blends, Trans 12 generally makes up more than 1 mole per cent of the blends, preferably about 5 to 25 mole per cent. In the premixes, the blowing agent blend is typically present in a concentration range of about 2-60 weight per cent (preferably 5-40 weight per cent), based on the weight of the polyol. In polyurethane

foam compositions, the effective concentrations of the blends are typically about 0.1-25 weight per cent (preferably 0.5-15 weight per cent), based on the weight of the total polyurethane foam formulation.

The other components of the premix and foam formulations may be those which are conventionally used: for example, fire retardants, polyol and surfactants on the B-side, and polyisocyanate on the A-side. Water is frequently used as a co-blowing agent. The A and B sides are typically mixed together, followed by injection of the catalyst, after which the mixture is poured into a mould or box.

Source: www.freepatentsonline.com

A 3-G blowing agent

Isochem (HK) Ltd., a member of the Kautschuk Gesellschaft group based in Germany, has introduced ISOCEL 245fa into the market. ISOCEL 245fa is a 3rd generation blowing agent. ISOCEL 245fa is non-inflammable and has zero ozone-depleting potential (ODP). ISOCEL 245fa is a safe replacement for HCFC-141b and other fluorocarbon and non-fluorocarbon blowing agents.

Contact: Isochem (HK) Ltd., Suite 901B, Kinwick Centre, 32 Hollywood Road, Central, Hong Kong SAR, Hong Kong. Tel: +852 2519 4341; Fax: +852 2511 6711

E-mail: donna@kautschuk.com

Source: www.kautschuk.com

High-performance insulating sheathing

Aerodynamic Developments Ltd., Australia, offers Thermax Sheathing, a high-performance insulating sheathing for roof, wall and floor applications in residential and commercial constructions. The sheathing is a closed cell PIR foam core with glass-fibre reinforcement and solid aluminium facers on both sides. The glass-fibre reinforcement, along with chemical modifications, contributes to higher dimensional stability and improved fire performance with a USA Class A fire rating.

Hydrocarbon blowing agents are employed in the manufacturing process of the sheathing, resulting in a product without any ozone depletion potential. Thermax Sheathing also has a lower K-value than most other insulation materials, making it a practical and affordable insulation material.

Contact: Aerodynamic Developments Pty. Ltd., Unit 8, #171-175 Newton Road, Wetherill Park, NSW 2164, Australia. Tel: +61 (2) 8788 9555; Fax: +61 (2) 9604 7468

E-mail: sales@aeromfg.com.au

Source: www.infolink.com.au

Pentane-blown foam unit

Gusmer Corporation, a subsidiary unit of Gusmer Machinery Group, the United States, has both standard equipment and custom equipment that will process alternative blowing agents to 141b. At Construction Polymers International, Gusmer successfully demonstrated its new machine designed specifically for processing pentane-blown spray foam systems. Gusmer developed the new machine specifically for ExxonMobil to demonstrate the new foam blowing agent technology, and to show that pentane is a viable alternative to 141b-blown foam systems.

The technical data of the units are as follows:
Maximum output : 7 kg/min
Max. rated pressure : 108 bar
Air requirement : 12 litres/sec @ 7 bar
Electrical load : 8.7 kW
Weight : 63 kg
Dimensions : 61 cm 46 cm 61 cm

Contact: Construction Polymers International Inc., 284 Seventh Street NW, Barberton, Ohio, OH 44203, United States of America. Tel: +1 (330) 861-5200

E-mail: info@cpifoam.com

Source: www.cpifoam.com

Foam formulation alternatives to HCFC-22

Transcend PUR blends, from Arkema Inc. (previously Atofina Chemicals), the United States, are a suitable replacement for HCFC-22 in pour-in-place blowing agent formulations for polyurethane rigid foams. A combination of Transcend additive and HFC-134a can produce foams with at least the equivalent or better overall performance compared with HCFC-22 and HFC-134a in generic pour-in-place rigid PU foam formulations.

In addition to easier handling, as demonstrated by the lower vapour pressures and faster blowing agent addition time to the polyol pre-blend, the formulations containing 10-20 weight per cent Transcend additive (weight per cent of the total blowing agent) have improved flow, gives adequate dimensional stability, excellent adhesion and acceptable thermal conductivities. Transcend additive is based on trans-1, 2-dichloroethylene, and can be added to hydrocarbon and hydrofluorocarbon foam formulations to create unique foam products. It is a liquid at room temperature (bp 48C), with zero ozone depletion potential and low global warming potential.

Contact: Arkema Inc., 2000 Market Street, Philadelphia, PA 19103 3222, United States of America. Tel: +1 (800) 225 7788; Fax: +1 (215) 419 7591.

Source: www.news.thomasnet.com

HALONS

Fine water mist

One potential halon replacement undergoing extensive development is the use of fine water mist a water droplet size distribution where 99 per cent of the water volume is contained in droplets less than 1 mm in diameter. The most effective fine water mist systems have a volumetric average droplet size diameter of about 40 m. ADA Technologies, the United States, has been a leader in fine water mist research since 1993. The applications addressed in ADAs current research and development programme include protection against fires in aircraft and fires in microgravity environments aboard spacecraft.

A proof-of-concept system for the aircraft fire application features a total weight of less than 34 kg, with over 18 kg of water available for application to the target fire. The layout is simple, robust and modular for ease of installation and maintenance. This module, designated the Modular Effervescent Atomization System (MEAS), is intended to protect about 1,000 ft3 volume. ADAs effervescent atomizer consists of a radial expansion nozzle, designed to create a supersonic flow section. The supersonic flow creates a shock wave that returns the flow to atmospheric pressure. In passing through the shock, the water droplets are further broken up to generate a fine water mist discharge to the protected space.

ADAs MEAS has certain advantages over conventional fine water mist fire suppression systems. Relative to a single-fluid system:

There is no need for a high-pressure pump, which requires auxiliary power supplies and may fail; and

The atomizer orifices can be larger so clogging does not occur.
Relative to a dual-fluid system:

The integrated agent supply/nozzle assembly eliminates the need for large propellant gas supply lines; and

The secondary effervescent atomization generates smaller droplet sizes with less propellant gas.

Contact: Mr. Jim Butz, Vice President, ADA Technologies Inc., 8100 Shaffer Parkway, Suite #130, Littleton, Colorado 80127-4107, United States of America. Tel: +1 (303) 792 5615; Fax: +1 (303) 792 5633

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Source: www.adatech.com

Solid-solid hybrid gas generator compositions for fire suppression

Mainstream Engineering Corporation, the United States, has secured a patent on a solid-solid hybrid gas generator composition, which includes a solid gas generator material and a solid flame retardant material. The flame retardant material may include one or more bromine-, chlorine- and phosphorous-containing compounds. The system is designed as a halon replacement technology.

The flame retardant material in the hybrid gas generator has several functions. First, its decomposition generates radical-scavenging decomposition products, which serve as chemically acting fire suppression agents. Since chemically acting agents are delivered to the fire, significantly less inert gas needs to be delivered. Thus, the hybrid system is significantly smaller and lighter than the current gas generator fire suppression systems. Second, it serves as a heat sink for the exothermic gas generation reaction, resulting in delivery of a cool gas to the fire. Third, when formulated directly with the inert gas generator, it acts as a binder for the formulation. This feature makes the formulation abrasion resistant.

The solid-solid hybrid gas generator has another advantage over conventional inert gas generator systems and the hybrid systems that use liquid or vapour agents. It requires only one storage vessel for both halogen-containing flame retardants and the gas generator materials. The solid flame retardant material has acceptable atmospheric properties and does not pose any global warming or ozone depletion threat during manufacturing, storage and handling. Upon release, the solid materials are in a very reactive form and are removed readily by the fire or in the troposphere, unlike gas and liquid agents that may not fully react when used, thus posing a threat to the environment.

Source: www.freepatentsonline.com

Fire suppression system

Kidde IP Holdings Limited, the United Kingdom, has received a United States patent on a system for discharging inert gas for extinguishing or suppressing a fire. The system has a fluid discharge control arrangement, which reduces the pressure in the fluid flow path downstream, thereby allowing the downstream pipe work to be selected to withstand a lower pressure than in a conventional system.

The fluid discharge control device described in the patent comprises a valve and a restrictor in the first flow path, and another valve-restrictor combination in the second flow path. Fluid (inert gas) from the containers flows initially through a first flow path and then through a second flow path, with the valves regulating the flow and the restrictors reducing the peak pressure. The system is designed to function with inert gases used as replacements for halon suppressants.

Source: www.freepatentsonline.com

Fluorine-free fire fighting agents

Chemguard Inc., the United States, has patented a foam concentrate that provides a fire-fighting composition when mixed with water. The concentrate is formed from the added water, and a high molecular weight acidic polymer (HMWAP) and a co-ordinating salt in the concentrate. The fire fighting concentrate is a synthetic type that meets and exceeds UL162 requirements for use on Class B fires.

The invention provides a method of extinguishing Class B non-polar liquid fires using the fire fighting compositions, either without or with very low added fluorochemical surfactants or fluorinated polymers. This method provides fast extinguishment and burn-back similar to that provided by FP and AFFF agents having high fluorochemical surfactant content. The HMWAPs used in the concentrate may include those containing multiple carboxylic acid groups or other functionally acidic groups, like sulphonic and phosphoric groups. The coordinating salts prefrerred are those having oxidation states of +2 and +3, such as the salts of aluminium, boron, calcium, iron, magnesium and zinc, but could also be barium, antimony, copper, etc.

Source: www.freepatentsonline.com

SOLVENTS

Vapour cleaning of metallic and electrical materials

Advanced Research Technologies of the United States has patented a drop in solvent mixture for use in vapour cleaning degreasing systems. Dibromomethane is used as the main component instead of high ozone-depleting chlorofluorocarbons such as Freon and 1,1,1 trichloroethane. Dibromomethane is mixed with other solvents including the low boiling point solvents such as nitromethane, 1,2 butylene oxide and 1,3, dioxolane as stabilizers which prevent the mixture from becoming acidic on the release of bromine into the atmosphere.

In the process, stabilized mixtures of dibromomethane will be added to a conventional vapour degreaser, allowed to reach 99C after about 30 minutes. At that temperature, dibromomethane boils and a vapour layer of the solvent is created. An object can be placed into that vapour layer, and the dibromomethane will condense onto that object. Any oil, grease, rosin, flux or similar organic material which was on the objects will then be dissolved by the condensed solvent and will drip back down into the boiling solvent and thereby be removed.

The vapours from the solvent will not contain any of the removed contaminants and therefore be ready to clean more objects of any hydrocarbon-soluble contaminant. When the solvent becomes too contaminated with oil, grease or flux, the boiling point of the dibromomethane will increase. When the boiling point reaches 107C, fresh dibromomethane must be replaced in the solvent.

Source: www.freepatentsonline.com

Biodegradable metaland mould cleaner

NEXGEN biodegradable metal and mould cleaner, from Slide Products Inc., the United States, is a biodegradable alternative to trichloroethylene and methylene chloride. It can clean oil, adhesive, ink, tar, silicone and lithium grease. It is formulated from citrus and vegetable products, leaves no oily residue and rinses away with water. NEXGEN cleaner is not a hazardous air pollutant and is non-corrosive. The product has no global warming compounds.

Contact: Slide Products Inc., 430 S. Wheeling Road, Wheeling, IL 60090, United States of America. Tel: +1 (847) 541 7220; Fax: +1 (800) 756 7986

E-mail: info@slideproducts.com

Source: www.news.thomasnet.com

Ozone-friendly cleaners and coatings

Arminius Telecom Inc., Canada, has brought out ozone-friendly cleaners and coating for different purposes.

l Arminius 2000 is a pulp/paper restorer spray coating for brittle and/or bare copper conductors, and pulp- or paper-insulated in-cable sheath openings. It bestows abrasion resistance and may be applied on live conductors.

Arminius 941S, a cable grease cleaner, provides an effective and quick way to remove cable grease from conductor bundles. It is a non-toxic and non-inflammable solvent that does not adversely affect conductor or cable materials. It may be used in aerosol form or in bulk.

Arminius 4050 is a printed circuit board (PCB) coating to reclaim PCBs. It offers easy and economical protection of PCB surfaces. The coating is practically non-inflammable, and may also be applied as moisture barrier for relays, switches, connectors, etc. It is meant for use in an environment unprotected against corrosion.

Arminius 7011 is a spray against wasps and hornets, with a reach of about 7 m. It may be used indoors or outdoors.

Contact: Arminius Telecom Inc., P.O. Box 42005, Conestoga Mall Postal Station, Waterloo, Ontario N2L 6K5, Canada. Tel: +1 (519) 886 1996; Fax: +1 (519) 886 9881

E-mail: arminius@sentex.ca

Source: www.strategis.ic.gc.ca

Economical flux remover

Flux-Off from ITW Chemtronics in the United States, which uses Chemtronics VERIZANETM cleaning chemistry, is a very economical line of ozone-safe, fast-drying cleaning solutions. Engineered to replace HCFC-141b, these low-odour, no-flash, no-residue, non-inflammable aerosols offer the most cleaning value for money. They clean rosin fluxes (R, RMA, RA) and no-clean flux from printed circuit boards, component leads, surface mount devices/pads, screens and stencils. The product comes in 12 oz aerosol packs.

Contact: ITW Chemtronics, 8125 Cobb Centre Drive, Kennesaw, Georgia, GA 30152, United States of America. Tel: +1 (800) 645 5244; Fax: +1 (770) 424 4267

E-mail: askchemtronics@chemtronics.com

Source: www.chemtronics.com

CFC-free cleaners

NTE Electronics, the United States, offers a wide range of CFC/HCFC-free cleaners for different purposes. They include the following.

RX500 is a contact cleaner with lubricant that cleans and provides protection against corrosion for

electronic/electrical components. It quickly removes grease, oils, solder oils, fluxes, oxidation, dirt and other contaminants. RX500-12 is similar a fast-acting variant.

RX1100 is a non-abrasive, non-inflammable general-purpose cleaner for use on printed circuit boards, computers, office machines, disks, film, magnetic tape heads, etc. It is a high-pressure, compressed gas that removes dust, lint, oxide particles and other dry contaminants.

RX1500 isopropyl alcohol is another general-purpose cleaner that evaporates fast and is safe on plastics. It is non-corrosive and leaves zero residue. It comes either in a 16 oz plastic bottle or 100 pre-saturated wipes.

RX1900 is a general-purpose defluxer, which is a blend of solvents and alcohols. It cleans most no-clean fluxes, evaporates fast and is safe on plastics. It is non-corrosive and leaves zero residue.

RX2600 label and adhesive remover is a natural solvent that penetrates rapidly, and is safe on most plastics. It effectively removes gummy residue, labels, stickers, ink marks and several other contaminants. RX2600 comes in pen or 4.5 oz can.

RX3200 is a general-purpose wash for electronic and electrical components and equipment. It has a superior penetrating action, without leaving any residue. It quickly removes oxidation, dirt, grease, oils and other contaminants. RX3200 is safe for use on most plastics, paints and elastomers.

Source: www.nteinc.com

Electronics cleaning solvent for mining maintenance

Waco Industries, South Africa, supplies a range of cleaning products, from CRC Industries, used to instantly remove grease, oil, dirt, flux and other contaminants at mines. NF Contact Cleaner from CRC is used as a precision cleaning solvent for electronic and electrical parts such as relays, switches and contacts and for flux removal from printed circuit boards. Because NF Contact cleaner is a non-inflammable cleaner and has no flash point (non-combustible), it is suitable for use in cleaning electronic and electrical parts of mining machinery and equipment. The product has a high-purity formula, which evaporates fast without leaving any residue.

CRC products do not contain any CFCs, methyl chloroform or trichloroethylene and are free of solvents known to cause ozone depletion. Each product from CRC has its own 16-point material safety data sheet available. CRC manufactures over 200 products are in the following categories: lubricants and penetrants, cleaners, corrosion inhibitors, cutting fluids, appearance products, and food-grade products.

Source: www.miningweekly.co.za

PFPE and HFPE solvents

GALDEN SV and H-GALDEN ZV solvent fluids, from Solvay S.A. o0f Belgium, are low molecular weight perfluoropolyether (PFPE) and hydrofluoropolyether (HFPE) that can be used in many electronic and semiconductor cleaning applications. Their key features include:

They exhibit a wide range of boiling points from 55C to 130C;

They do not contain chlorofluorocarbons or any chlorine, bromine and iodine compound, and have zero ozone depletion potential.

They do not require particular safeguards or use-restrictions and are fully compatible with all metals, and a wide variety of rubbers and commercially available elastomers and plastics.

The solvents are formulated to be compatible and fully miscible with PFPE oils and greases. They are fully miscible with perfluorocarbon fluids and with chlorotrifluoroethylene oils above 45C.

Source: www.solvaysolexis.com

FUMIGANTS

New lab methods for speed testing of fumigant emissions

A simpler, quicker way to track pesticide emissions from agricultural fields has been devised by the United States Agricultural Research Service (ARS) scientists. Using low-cost laboratory tests and mathematical models, research leader Dr. Scott Yates and colleagues at the United States Salinity Laboratory in California are able to evaluate and even predict fumigant emissions.

Each potential methyl bromide replacement will require its own set of regulations, based on findings from complex field studies that may number as many as 60. Such studies can take up to a year to complete and very expensive, besides exposing researchers to toxic chemicals. Dr. Yates team has shown that lab tests can yield some of the same results as those painstakingly obtained from outdoor field studies. To collect their data, the ARS scientists designed elaborate soil columns and soil cell equipment with which to observe pesticide movement through soil. They combine data collected this way with numerous mathematically driven models. Dr. Yates admits that field studies will always be needed to tie lab-based findings to the real-world agricultural landscapes.

Source: www.ars.usda.gov

New fumigant to secure grains

In Australia, a partnership between CSIRO and the Grains Research & Development Corporation (GRDC) is setting up alternatives to phosphine fumigation and chemicals facing environmental phase-outs. Phosphine has been the mainstay of insect control in stored grain and an important factor in Australias reputation for clean grain in export markets. However, in Australia pressure has been on to find a new fumigant, as increasing numbers of insects show signs of phosphine resistance. Most alternatives have been discarded because of environmental issues, such as residues or ozone-depleting characteristics.

Over the past 10-15 years, CSIRO Entomology Department has carried out several successful GRDC projects investigating fumigant alternatives. So far, the most promising has been GLO2, which contains 95 per cent ethyl formate and five per cent isothiocyanide, both of which are naturally occurring chemicals. GLO2 has been formulated as a liquid fumigant for directly spraying onto grains. It will vaporize in situ, but can also be vaporized prior to use if required. A big advantage is that it is quick GLO2 takes less than a day to fumigate and there is no withholding period, the researchers say. It can be used to fumigate bulk stores, replacing methyl

bromide, and for structural and equipment fumigation, replacing dichlorvos. It could also be used as part of a phosphine-resistance management strategy.

Although laboratory tests, on-farm trials and 50-tonne silo trials have already proven the products ability, the team must now focus on providing data to support an application for product registration.

CSIRO is undertaking regionally based storage trials with all grain types to understand GLO2s toxicology, so that label rates, environmental effects, efficacy and health and safety issues can be determined. GLO2s advantages include:

Shows a high level of efficacy in eradicating major grain pests at all life stages;

Acts quickly and leaves virtually no residue;

Does not affect grain quality;

Breaks down to compounds that occur naturally in grains;

Is a liquid that is safe and simple to use in comparison to other fumigants and pesticides;

Has component compounds that are already in use as fumigants and food additives; and

Does not affect the ozone layer or contribute to greenhouse gases.

Source: www.grdc.com.au

PUBLICATIONS

Blowing Agents and Foaming Processes 2007

The ninth international Rapra conference dealt with key issues related to the critical role of blowing agents in foamed plastics and rubber. Foamed materials are being enhanced to replace dense solid polymers, reducing weight and costs. The conference proceedings include papers from industry leaders and will appeal to those involved in the formulation and application of blowing agents and techniques to produce expanded or foamed polymer substrates.

Contact: Rapra Bookstore, Rapra Technology Ltd. Shawbury, Shrewsbury, Shropshire SY4 4NR, United Kingdom. Tel: +44 (1939) 250383; Fax: +44 (1939) 251118

E-mail: publications@rapra.net

Polymeric Foams: Science & Technology

This third volume in the Polymeric Foams Series provides comprehensive coverage of the fundamentals, technologies, applications, and recent developments. It covers the basics of foaming mechanisms, foaming technologies, product applications, processing methods, and recent developments in biodegradable and composite foams.

Contact: Lavoisier Booksellers, 14 rue de Provigny, 94236 Cachan Cedex, France. Tel: +33 (1) 4740 6700; Fax: +33 (1) 4740 6702.

HTOC Assessment Report 2006

The 2006 Assessment Report of the Halons Technical Options Committee (HTOC) reviews progress that has been made in the military, civil aviation, merchant shipping, oil and gas production, and explosion suppression sectors to reduce the need for Halons in fire protection systems.

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