VATIS UPDATE

Ozone Layer Protection

Vol. 4 No. 113 • Jul - Aug 2012
ISSN 0971-5657

Apprise yourself with the latest technological innovations

Highlights

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UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

Asian and Pacific Centre for Transfer of Technology (APCTT)

Ozone Cell
Ministry of Environment and Forests
Government of India

The **Asian and Pacific Centre for Transfer of Technology (APCTT)**, a subsidiary body of ESCAP, was established on 16 July 1977 with the objectives: to assist the members and associate members of ESCAP through strengthening their capabilities to develop and manage national innovation systems; develop, transfer, adapt and apply technology; improve the terms of transfer of technology; and identify and promote the development and transfer of technologies relevant to the region.

The Centre will achieve the above objectives by undertaking such functions as:

- Research and analysis of trends, conditions and opportunities;
- Advisory services;
- Dissemination of information and good practices;
- Networking and partnership with international organizations and key stakeholders; and
- Training of national personnel, particularly national scientists and policy analysts.

The shaded areas of the map indicate ESCAP members and associate members

Cover Photo

Low global warming blowing agent HFO-1234ze used in multiple foam and aerosol applications

(Credit: Honeywell International Inc., the United States)

VATIS* Update
Ozone Layer Protection
is published 6 times a year to keep the readers up to date of most of the relevant and latest technological developments and events in the field of Ozone Layer Protection. The Update is tailored to policy-makers, industries and technology transfer intermediaries.

Website: http://www.techmonitor.net

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Research on ozone layer repair

Ozone depleting substances, such as chlorofluorocarbons (CFCs), that have depleted parts of the Earth's ozone layer will continue to be problematic in the future too. Some studies have brought to the fore the challenges that the ozone layer may face in the future, making the prediction of a mid-century turnaround repair shaky. One study linked storms to ozone layer depletion over the United States. The study pointed to water vapour, sent into the stratosphere by storms, as a catalyst to ozone destroying reactions by CFCs. This possibility puts the ozone layer at the edge of depletion by future storms, in regions inhabited by humans. The study funded by NASA was limited to the United States. However, the scenario may not change even if the study were to be repeated elsewhere. Global warming is known to trigger these storms, and since it is on the rise, it will likely cause ozone depletion. This risk now requires the world to look at what can be done to repair the ozone layer artificially.

Global warming poses a serious problem; increase in emissions of gases responsible for global warming may lead to a new average for the Earth's temperature. There are suggested procedures, classed as climate engineering, to reduce this risk if necessary in the future. One of these procedures is 'aerosol injection' to the stratosphere, to disperse inbound solar rays. This process puts sulphate particles in the stratosphere, which is another catalyst for ozone destruction reactions. The possibility that storm fury and large-scale aerosol injection are likely in future prompts a look into techniques that will benefit repair of the ozone layer. One such technique is to inject oxygen gas into the ozone layer, to join in reactions that become ozone, at depleted areas. This research is based on the argument that oxygen released from ozone destruction reactions by CFCs becomes dormant, reducing total reactive oxygen amounts. Oxygen could be carried in liquid form by unmanned aircraft and discharged as gas at low stratospheric altitudes. The oxygen would be injected at preferred areas, assessed using computer models to have low amounts of CFCs or unfavourable conditions. A few flights will do at a given time and does not carry substantial risk for the climate system or regions. Ozone repair tests or research may also provide insight into atmospheric chemistry of what happens to oxygen liberated from ozone destruction reactions; to see into how they may be catalysed to go into reactions, faster if usually delayed, or active if permanently inactive.

Source: www.nl-aid.org

Fish getting skin cancer from ultraviolet radiation

A coral trout with melanoma

Scientists inadvertently found that wild fish are getting skin cancer from ultraviolet radiation. According to researchers from the Australian Institute of Marine Science, approximately 15 per cent of coral trout in Australia's Great Barrier Reef have cancerous lesions on their scales. In that regard, these fish resemble Australians who live on land – two in three people who live down under will be diagnosed with skin cancer before the age of 70, the highest rate in the world. It is probably no coincidence – Australia is under the Earth's biggest hole in the ozone layer.

Scientists in Australia were conducting a survey of shark prey, predominantly coral trout. They kept seeing strange dark patches on the normally bright orange fish. For help, the scientists turned to another research team from the University of Newcastle, the United Kingdom, studying coral disease in the area. The research team's first guess was that the patches were caused by an infection. However, screening for microbial pathogens yielded negative results. On deeper investigation, the researchers found tumour formations and compared these with samples from fish that had been given melanoma – the most dangerous type of skin cancer – as part of a laboratory experiment. They looked nearly identical.

Source: www.latimes.com

Healing ozone layer lowers UV exposure

Carcinogenic ultraviolet (UV) rays on the ground have been diminishing in recent years, researchers led by Mr. Christos Zerefos at the Research Centres for Atmospheric Physics and Climatology at the Academy of Athens in Greece conclude in a recent study, published in the journal *Atmospheric Chemistry and Physics*. "The results are encouraging," said Mr. Markus Rex, an ozone expert at Alfred Wegener Institute for Polar and Marine Research in Potsdam, Germany. The fact that the ozone layer in the regions researched has become

thicker is a result of the successful Montreal Protocol, he added. The study findings are based on data collected between 1990 and 2011 at 12 measuring stations in Europe, Canada and Japan. The stations measured the intensity of solar rays in several wavelengths and at a number of altitudes. Mr. Zerefos stated that the data also applied to regions where the measuring stations are not located.

The scientists have concluded that the ozone already began healing slightly in 1995. Ironically, during the same period, the fact that more stringent environmental protection measures were implemented in many countries led to cleaner air, thus opening the way for people to be exposed to greater amounts of dangerous UV rays. Since 2007, however, that effect of cleaner air and greater exposure to UV rays has been surpassed by a healing ozone layer, Mr. Zerefos and his colleagues conclude. They believe 2007 marked a turning point for the protective layer in the atmosphere. Compared with that year, today there is 2-4 per cent less UV-B exposure on the ground. UV-B rays can penetrate deeply into the skin and, in high doses, are considered particularly dangerous.

But even if the danger has been reduced, the all-clear signal hasn't been given yet. Mr. Rex warns that dangerous exposure is still possible in Europe and in the northern parts of Asia and North America, particularly during the spring. In recent years, the unusually strong cooling of higher levels of the atmosphere has in several instances led to an extreme, but temporary loss of ozone in the higher latitudes. In 2011, scientists spoke for the first time of an ozone hole in the North that was five times the size of Germany. Until then, ozone depletion had been primarily isolated to the South Pole. It is colder above the snowy wasteland of the Antarctic, and at -78°C, the ozone begins to recede. Below this threshold the CFC destruction begins, accelerated by the springtime sun. Researchers are baffled as to why the upper atmospheric layers are now also cooling off so fast in the North too. Greenhouse gases like carbon dioxide, which warm air near the earth's surface, actually cause upper layers of the atmosphere to cool. Still, this "inverse greenhouse effect" explains only part of the cool down.

Source: www.spiegel.de

Ozone hole UV impacting marine life

Ultraviolet (UV) rays have caused a steep increase in deaths among marine animals and plants, according to an international team that includes scientists at the Oceans Institute of University of Western Australia (UWA). The team synthesized 1,784 published experiments on marine organisms around the world to evaluate the magnitude of impacts that the increased UV-B radiation caused. Until now, the role of UV-B radiation as a possible cause of the global decline in the health of marine ecosystems had not been quantified. The marine life most affected by U-VB are protists (such as algae), corals, crustaceans and fish larvae and eggs, thereby affecting marine ecosystems from the bottom to the top of the food web.

According to Winthrop Professor Mr. Carlos Duarte, Director of UWA Oceans Institute and co-author of the study, the impact of increased UV-B radiation had not been fully addressed to date because of two key misconceptions: one, that the Montreal Protocol "fixed" the ozone layer and two, that UV-B does not penetrate to significant depths in ocean waters. "Whereas the Montreal Protocol was effective in preventing further deterioration of the ozone layer, this has not yet recovered, and now we know that damaging UV-B radiation can penetrate to considerable depths in clear ocean waters," Prof. Duarte stated. The new international study builds on evidence of considerable impact of UV-B radiation on marine plankton and ocean processes. The research was co-ordinated by UWA's Professor Susana Agustí. The Spanish National Research Council and the Catholic University of Chile were also involved in the research.

Source: phys.org

Research shows Sun's rays are getting stronger

Experts with the Canadian Institutes of Health Research report that the ozone layer is not providing as much protection from the Sun as it used to. The ozone layer is depleting and that means the harmful rays are becoming more powerful. The Canadian Cancer Society says that non-melanoma skin cancer rates have tripled since the 1960s, while the more dangerous melanoma rates have gone up by 15 times.

Source: winnipeg.ctvnews.ca

UNEP HCFC Help Centre

The Help Centre helps developing countries phase out ozone depleting hydrochlorofluorocarbons. For further information, contact:

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Email: ozonaction@unep.org

AC units that meet 2016 efficiency standards sold

Indian manufacturer Godrej, which began commercial production of R290 room air-conditioners (ACs) in April 2012, has sold about 3,000 units within the first three months. According to Mr. Dilip Rajadhyaksha, Senior General Manager of Manufacturing, Godrej was the first manufacturer in India in 2000 to introduce the R290 hydrocarbon refrigerant by Linde/BOC, using a high-efficiency compressor. The new AC units with 3,375 W and the 4,900 W cooling capacities feature an energy efficiency ratio (EER) of 3.7 and achieve a five-star rating performance in India. The EER 3.7 of the two R290 units compare to values of 3.4 achieved by R22 products on the market. It is higher than the 3.63 efficiency achieved by best-in-class inverter technology AC models in India.

During the R&D stage, and after laboratory modifications that would enable the testing of R290 (e.g. introducing hydrocarbon gas sensors, ventilation system and alarm system), Godrej's test methodology aimed at studying the performance of R290 vis-a-vis HCFC-22. For this, the company's strategy consisted of carrying out drop-in testing using a standard HCFC-22 compressor of 5-10 per cent higher rated capacity and then, depending on results, working on other elements of the refrigeration system. With the drop-in test results revealing lower power consumption with R290, Godrej then determined the charge limit for a typical split AC of 5 kW capacity as per safety standard EN 378. The company carried out trials by varying some of the unit's elements, namely smaller diameter condenser tubes and micro-channel heat exchangers (brazed aluminium) – which proved to be the game changer.

Source: www.hydrocarbons21.com

New centrifugal and screw chillers

Kirloskar Chillers has introduced centrifugal chillers under the brand name Turbotek™, and screw chillers under the brands Prodigy™ and Bravura™. Turbotek™ is available in two configurations – single compressor and dual compressor – in a range of 200 TR to 2,400 TR using HFC-134a refrigerant. Prodigy™ and Bravura™ come in a range of 50 TR to 555 TR with HFC-134a, HFC-407C and HCFC-22 refrigerants. Kirloskar Chillers is said to be the first Indian chiller manufacturing company to have a test bed facility certified by the Air-Conditioning, Heating and Refrigeration Institute (AHRI) of the United States. It recently received AHRI's recognition for qualifying annual product certifying tests for three consecutive years.

Source: www.ishrae.in

Compressor running on eco-friendly refrigerant

A compressor that runs using the environment-friendly hydrocarbon R290 refrigerant has been developed by Emerson Climate Technologies (India) Ltd. at its plant in Satara district, Maharashtra. R290 is a natural refrigerant having zero ozone depletion potential (ODP) and a low global warming potential (GWP), as defined by the Kyoto Protocol. In commercial refrigeration applications, these new R290 compressors are more efficient than other chemical refrigerants. The company has already developed three R290 compressor models and will support the environmental initiatives by some of the largest beverage manufacturers in India. It exports compressors to countries across Europe, the Middle East, Latin America and Asia.

Source: www.fnbnews.com

Awareness workshop on CFC-free MDIs

Development Facilitators, an Indian NGO, was employed by the United Nations Environment Programme (UNEP) to organize five awareness workshops (one national and four sub-national) on transition of metered dose inhalers (MDIs) from chlorofluorocarbon (CFC) propellants to CFC-free ones, to garner support for strengthening patient-doctor-industry co-operation. The workshops brought together various stakeholders, especially MDI manufacturing industries, importers of inhalation products and general practitioners. Enhanced communication across different sectors of government and between government and industry was one of the main factors in India's successful transition.

Source: www.multilateralfund.org

New Reports from the Ozone Secretariat

The Ninth Edition of the Handbooks for the Montreal Protocol on Substances that Deplete the Ozone Layer and the Vienna Convention for the Protection of the Ozone Layer, 2012, are now available from the Ozone Secretariat. For more information, contact:

Ozone Secretariat, UNEP
Tel: +254 (20) 762 3851; Fax: +254 (20) 762 0335
E-mail:ozoneinfo@unep.org

Asia-Pacific nations happy with climate protection talks

Governments of the Asia-Pacific countries, together with international organizations as well as the donor countries, attended the Joint Network Meeting of Ozone Officers of South Asia and Southeast Asia and the Pacific, conducted on 17 May 2012 at Paro, Bhutan. The meetings were organized by United Nations Environment Programme (UNEP) OzonAction in cooperation with the National Environment Commission of Bhutan. Funding support for the meeting came from the Multilateral Fund (MLF) for the Implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer. The network meetings, conducted twice a year, discuss strategies and progress of action plans to enable countries in the region to achieve the Montreal Protocol's targets. Notable among those targets is the phase out of hydrochlorofluorocarbons (HCFCs).

The first network meeting of 2012 in Bhutan was particularly special for the international community working on ozone layer protection as it was also a time for a regional celebration of the Montreal Protocol's 25th Anniversary. The theme of the Bhutan meeting was 'HCFC Freeze: 231:33:5535.' The number represented the days, weeks and hours remaining for the developing countries to meet their first HCFC-related compliance target – the freeze of consumption by 1 January 2013. "The clock is ticking and countries must act quickly to ensure that the targets are achieved," stated Mr. James Curlin, Interim Head, UNEP OzonAction Branch. "HCFC licensing and enforceable quota systems are among the key priorities for action," he added.

Without the Montreal Protocol, the Earth would have been on track to lose two-thirds of its ozone layer by 2065, leading to dramatic rise in skin cancer, according to a report of the United Nations Secretary-General's High-level Panel on Global Sustainability. The multilateral action under the Montreal Protocol has prompted the steady recovery of the ozone layer. There is still a need for more strong multilateral action and more rapid progress in reducing greenhouse gas emissions, especially in view of the world population reaching 7 billion and the consequent growth in the demand for food, energy and resources. "The reduction of HCFCs under the Montreal Protocol will significantly contribute to this global effort to reduce the greenhouse gas emissions, and the Compliance Assistance Programme of the UNEP Regional Office for Asia and the Pacific will be most ready to assist countries in the region in the best way possible," said Mr. Atul Bagai, Senior Regional Coordinator of UNEP OzonAction. The three-day meeting was followed by a workshop on "Climate and Energy Use Linkages to HCFC Phase-out", which aimed to explore ways to connect energy-efficiency benefits with the transition to non-HCFC technologies.

Source: www.unep.org

Legal professionals discuss Montreal Protocol

High-ranking judges, lawyers and representatives of law firms from India and Thailand attended the Social Justice and Environmental Sustainability Conference, held on 8 June 2012 at the United Nations Conference Centre in Bangkok, Thailand. This meeting was organized by the OzonAction Branch of the United Nations Environment Programme Regional Office for Asia and the Pacific (UNEP ROAP) in cooperation with the Asia-Pacific Jurist Association (APJA). The conference discussed the role, responsibilities and challenges of judges, lawyers and businesses in achieving better environmental sustainability. It also provided a forum for judges, lawyers and other stakeholders to exchange views and experiences in safeguarding social justice, equity and environmental sustainability.

A key recommendation of the conference was the recognition of the need to empower the judiciary in preventing environmental crime from happening – deterrents must be made and environmental criminals must be punished adequately. As developing countries begin to reduce their production and consumption of hydrochlorofluorocarbons (HCFCs) under their Montreal Protocol commitments, there will be an increased risk of illegal trade in these substances. The Asia-Pacific region, in particular, will require the engagement of all law enforcing institutions to ensure sustained compliance. *Contact: Ms. Artie Dubrie, Programme Officer, OzonAction Programme, UNEP Regional Office for Asia and Pacific, United Nations Building, Rajdamnern Nok Avenue, Bangkok 10200, Thailand. Tel: +66 (2) 2882 128; E-mail: Artie.Dubrie@unep.org.*

Source: www.unep.org

Philippine phase-out plan for HCFC-141b

The Multilateral Fund (MLF) and the Government of Japan are financing the Sector Plan to Phase Out HCFC-141b in the Foam Sector in the Philippines. The project is being implemented by the United

Nations Industrial Development Organization (UNIDO) through the Philippine Ozone Desk (POD) of the Environmental Management Bureau (EMB), the Department of Environment and Natural Resources (DENR). The main objective of the project is to assist the Philippines in meeting its Stage 1 HCFC phase-out strategy in compliance with its commitment to Montreal Protocol – freeze in HCFC importation to the baseline level (or the mean of 2009-2010 HCFC importation) by 2013 and 10 per cent reduction in 2015. Two main recipients covered by the project are companies that use spray foaming machines for foam insulations and those that use fixed foaming machines for production of rigid foams, thermowares, refrigeration and flexible moulded line. Other recipients are those companies that are using locally fabricated spray foaming machines for foam insulations.

One of the major activities conducted under the project was a detailed assessment by an international expert of existing technologies at the plants of companies using fixed foaming machines. The companies using spray foaming machines were recommended to adopt the supercritical carbon dioxide (CO_2) technology from Japan, whereas those companies using fixed foaming machines have been asked to adopt cyclopentane technology for rigid foam producing both continuous and discontinuous panels, water-blown technology for thermoware and refrigeration, and liquid CO_2 technology for flexible moulded line.

Two Technical Working Groups (TWGs) were set up under the project. The first was organized for companies using spray foaming machines and the second was organized for companies using fixed foaming machines. Set up through the initiative of Ms. Ella Deocadiz, the POD-EMB Manager, the TWGs are meant to assist mainly EMB in the successful implementation of the project, ensure compliance to environmental regulations and spearhead the promotion of non-ODS technologies in the sector.

Source: emb.gov.ph

Awareness seminar on MeBr fumigation in Sri Lanka

The Sri Lanka Shippers' Council, affiliated to the Ceylon Chamber of Commerce, held an awareness seminar on regularizing methyl bromide (MeBr) fumigation procedure and usage on 1 June 2012 at the Ceylon Chamber of Commerce auditorium. A new directive has been issued by the National Plant Quarantine Services in relation to the usage of MeBr for fumigation for exports to regularize MeBr consumption in quarantine and pre-shipment (QPS) operation. Another reason for issuing this directive is that Sri Lanka is a signatory to the Montreal Protocol on the usage of ozone depleting substances (ODS), including MeBr, and needs to adhere to the Protocol's guidelines.

The seminar for various stakeholders focused on the effects of MeBr on the environment and the ozone layer, the importance of monitoring fumigation activities, International Standards for Phytosanitary Measures No. 15 (ISPM 15) and International Plant Protection Convention (IPPC) regulations for MeBr fumigation, guidelines on MeBr fumigation for export/import consignments (such as country requirements and statistics), fumigation conditions and practical difficulties faced during supervision, etc. Key officials of the Seed Certificate and Plant Protection Centre (SCPPC), National Plant Quarantine Services, Registrar of Pesticides, National Ozone Unit, Ministry of Environment, Tea Research Institute and Tea Board addressed the seminar. Exporters, shippers, freight forwarders and other MeBr treatment providers and users had an opportunity to learn more about this new procedure and usage. *Contact: Secretariat, Sri Lanka Shippers' Council, Ceylon Chamber of Commerce, Sri Lanka. Tel: +94 (11) 5588 880/871; Website: www.shipperscouncil.lk.*

Source: www.ft.lk

Viet Nam to phase out HCFCs by 2030

Hydrochloroflurocarbons (HCFCs) will be completely phased out in Viet Nam by 2030, according to Mr. Luong Duc Khoa, Ozone coordinator of the Department of Meteorology, Hydrology and Climate Change under the Ministry of Natural Resources and Environment. Under international commitments including the Vienna Convention and the Montreal Protocol to protect the ozone layer, over the past 15 years Viet Nam has successfully got rid of such ozone depleting substances (ODS) as chlorofluorocarbons (CFCs), halons and carbon tetrachloride (CTC). Viet Nam's consumption of CFC was 500 t and halon was 3.8 t. These substances were completely phased out since 1 January 2010.

Viet Nam is currently formulating a project themed "National Plan to eliminate HCFC" by 2030. The first phase of the project is from 2012 to 2017, funded under the Montreal Protocol's Multilateral Fund (MLF) with a total value of US$10 million. This phase targets at eliminating hydrochlorofluorocarbons (HCFCs) according to the road map planned for developing countries.

The main component of the project in this phase would be to eradicate 500 t of HCFC-141b and about 800 t of polyol containing HCFC-141b in 12 enterprises that produce insulating foams. The use of HCFC-141b in the production line would be supplanted with cyclopentane.

To gradually reduce the import of ODS, the Ministry of Industry and Trade (MoIT) and the Ministry of Natural Resources and Environment issued the joint Circular 47 for management of imports, exports as well as temporary import and re-export of ODS. MoIT is responsible for allocating annual import quotas for HCFCs from 2012 to 2019. For HCFC-141b, which has the highest ozone depleting potential of any HCFC, the 2012 quota has been set at 500 t, dropping to 300 t in 2013 and 150 t in 2014. For other HCFCs, import quotas for 2012 and 2014 are at 3,700 t and 3.400 t in 2013. From 2015 to 2019, annual imports will be no more than 3,600 t. After 2019, trade in HCFCs will be updated by the two Ministries and be permitted only with partners in countries that have ratified the Montreal Protocol.

Source: talkvietnam.com

Eco-friendly refrigerant to save climate

In Bangladesh, the Department of Environment (DoE), under a pilot project titled "National Ozone depleting Substances (ODS) Phase-Out Plan" and funded by the United Nations Development Programme (UNDP), initiated a nationwide campaign to promote the use of eco-friendly refrigerants.

According to Dr. Hirendra Kumer Das, Project Manager of the project, the 848.5 million taka (US$ 10.39 million) undertaking started in 2007. "As part of the plan, 2,500 technicians across the country have received training in retrofitting eco-friendly refrigerants, such as hydrocarbon blend, by replacing harmful chlorofluorocarbon (CFC)," Dr. Das stated. The training also covered retrofitting car air-conditioners and commercial chillers. Bangladesh Refrigeration and Air-Conditioning Merchants Association (BRAMA) has been working with DoE and UNDP, as project partner.

Using a recovery system, a trained technician can recover and recycle the refrigerant in the system. According to Mr. Md. Asaduzzaman, BRAMA Vice-President and UNDP Consultant for small and commercial refrigerator retrofit programme, the hydrocarbon blend used in the recovery system is three times more sustainable than any other refrigerant. UNDP representative Dr. Sarwat A. Chowdhury revealed that in the first phase, 10 recovery machines, 300 recovery cylinders, 800 vacuum pumps, 35 motorcar retrofitting kits, 7,450 domestic refrigerator retrofitting kits, 3,000 refrigerant hydrocarbon blends, 1,250 adaptors and 15 sets of tools were being funded.

Source: theindependentbd.com

China sets national safety standard for ignitable refrigerants

In June 2012, China released a national safety standard for inflammable refrigerants. The new safety standard, which will come into force on 1 May 2013, formally allows the adoption of inflammable refrigerants like R290 in the production of air-conditioners (ACs) in China. This could accelerate the market uptake of R290 ACs in China. "Household and similar electrical appliances, safety – particular requirements for heat pumps, air-conditioners and dehumidifiers" (GB 4706.32-2012), the first national standard on the use of inflammable refrigerants, was released by the General Administration of Quality Supervision, Inspection and Quarantine and the Standardization Administration of China. This standard was jointly drafted by the China Household Electric Appliance Research Institute and the Guangzhou CVC Institute of Technology Detection, in consultation with representatives from AC and refrigerator/freezers manufacturers.

The standard adopts the International Electrotechnical Commission (IEC) safety requirements for electrical heat pumps, ACs and dehumidifiers containing inflammable refrigerant (IEC 60335-2-40:2005). Compared with the earlier version (GB 4706.32-2004), the new version of the safety standard sets detailed rules for safe operation relating to safety warning, transportation, installation, storage and charging of inflammable refrigerants. The new standard applies to heat pumps with electric motors, compressors or room fan-coil units, ACs and dehumidifiers. For refrigerant R290, the standard provides a formula for calculating the refrigerant charge quantity and security values for installation height, housing area, refrigerant concentration, etc.

Source: www.hydrocarbons21.com

Words Unify to Protect the Ozone Layer

A multi-media compilation of unique and inspring quotations from all around the world on the protection of the Ozone Layer.

For more information access:

http://www.unep.fr/ozonaction/information/quotes/tagcloud/quotes.html

CO_2 refrigeration cycle model using ionic liquid co-fluid

Researchers at the Department of Chemical and Biomolecular Engineering, University of Notre Dame, the United States, have investigated modelling a carbon dioxide (CO_2) refrigeration cycle using an ionic liquid (IL) co-fluid. Aprotic heterocyclic anion (AHA) ILs have been proposed for use as co-fluids because of their very low volatility, stability over a wide temperature range and capacity for absorbing CO_2. As these materials absorb CO_2 both chemically and physically, their affinity for CO_2 can be finely tuned through appropriate chemical functionalizations.

To analyse AHAILs' performance in a refrigeration system, the scientists developed a co-fluid cycle model that incorporates both physical and chemical absorption of CO_2 by ILs. The model describes the compression, expansion and heat exchange processes in terms of basic physical and chemical principles and predicts optimal operating pressures and resulting coefficients of performance. Principal inputs are the enthalpies and entropies of solution, as may be derived from experimental absorption isotherms or predicted by *ab initio* quantum chemical calculations. By determining desirable ranges for the chemical properties of the co-fluid, the model provides theoretical guidance for the design of suitable ILs.

Source: aiche.confex.com

Climate-friendly cooling made easier

Researchers in the United States report a new safety valve that ensures millisecond shut-off operation. The new valve – developed by inventor Mr. Richard Maruya of A.S. Trust & Holdings, and researcher Mr. George Whitmyre, principal safety consultant at Whitmyre Research – addresses potential safety issues in the use of inflammable and/or toxic refrigerants, including the hydrocarbon multi-blends such as R441A and R443A, as well as straight hydrocarbons, ammonia and carbon dioxide (CO_2). "The safety valves work in pairs to isolate and contain the refrigerant," Mr. Whitmyre said.

By incorporating these valves into new system designs, engineering teams are now free to more safely employ hydrocarbon refrigerants in their specifications and also ensure a safety-stop-leak in ammonia systems for a wide range of applications. From refrigerated transport and automotive air-conditioning systems to commercial refrigeration and display cases, use of this valve will supply the critical inline shut-off performance required to meet regulatory safety concerns. The design of this valve ensures millisecond shut-off operation that works with both inflammable hydrocarbon refrigerants and high-volume ammonia/high-pressure CO_2 and prevents them from leaking into critical areas. *Contact: ComStar International Inc., #20-45, 128th Street, College Point, New York, NY 11356, United States of America. Tel: +1 (718) 445 7900; Fax: +1 (718) 353 5998; E-mail: info@comstarproducts.com.*

Source: www.prweb.com

Hydrocarbon-run air-cooled chiller

Johnson Controls Inc., the United States, offers Sabroe SABlight, an air-cooled chiller with frequency-controlled screw compressor and uses hydrocarbon refrigerant. The

SABlight air-cooled chiller

new compressor is designed for outdoor, low-capacity applications and is available in a low-noise version. The standard SABlight range uses V-coil condensers, providing a significantly reduced footprint despite its increased production flexibility. Both the compressor and exchanger are fitted under the V-coils, for a maximum height of 2.79 m and a width of only 1.20 m. SABlight is a factory-assembled chiller, complete with cooling system, electrical wiring and cold water connections. The piping system has been pressure-tested to make it ready for installation on site. All elements comply with the current European Union directives. The high coefficient of performance (COP) of Sablight, ensured through the frequency-controlled standard compressor, is claimed to outpace all hydrofluorocarbon (HFC) chillers. The wide control range makes it a highly flexible chiller that operates efficiently, even at low loads.

Source: www.sabroe.com

Deck models with R290 hydrocarbon refrigerant

The Central American group Fogel, based in Guatemala, has developed more than ten refrigerator models using R290 hydrocarbon refrigerant gas, including sub-zero

Froster® refrigerators for beer. For its newest generation of hydrocarbon refrigerators, Fogel employs a deck system to make services safer and easier. These coolers feature an all-in-one integrated refrigeration system known as the modular deck, containing all of the condensing unit and evaporator components in a single module. In less than two minutes, the entire refrigeration deck can be replaced at the point of sale without the need for removing the cooler. The compact deck module is intended to be transported to service centres where only qualified technicians are to perform services, eliminating the need of transporting hydrocarbon tanks from one location to another or moving the refrigerator to a service location.

Some of the common, key features of Fogel hydrocarbon ranges are: tropicalized units with robust structures; cyclopentane blowing agent; and a comprehensive service network. *Contact: Fogel de Centroamérica, S.A., 3a. Av. 8-92, Zona 3 Lotificación El Rosario, Mixco, Guatemala 01057. Tel: +502 2410 5800; Fax: +502 2438 0964; E-mail: foca@fogel-group.com.*

Source: www.hydrocarbons21.com

Air-conditioning by evaporation

Evaporative coolers that use water as a refrigerant are one of the few viable energy-saving technology alternatives to air-conditioning. But they only function when the air is dry and tend to deliver humid air. In the United States, a new technology from National Renewable Energy Laboratory (NREL), AIL Research and Synapse Product Development LLC has the potential to bring evaporative cooling into wider usage. The new technology – Desiccant-Enhanced Evaporative

A DEVAP prototype at NREL's HVAC Systems Laboratory

Air-Conditioning (DEVap) – operates on the same principle as evaporative coolers but is indirect. Incoming air is in thermal contact with a moistened surface that evaporates the moisture into a separate air stream. As the evaporation cools the moistened surface, it draws heat from the incoming air without adding humidity to it.

The system uses a desiccant to absorb water vapour. This exothermic process releases heat that can warm both the desiccant and the incoming air. However, DEVap's liquid desiccant is also in contact with a plastic sheet that provides thermal contact between the desiccant and a stream of water. As outdoor air flows past, water evaporates, cooling this surface. The cooler water also draws heat from the desiccant, keeping it cool and maintaining its effectiveness. The two stages of DEVap allow it to operate effectively in a wide range of climates without consuming high levels of water.

Source: www.rdmag.com

R32: A viable R410A replacement

With performance comparable to R410A, the inflammable refrigerant R32 could be a potential low-global warming solution for mainstream air-conditioning (AC) and heat pump applications, according to latest research. The research carried out by Mr. Hung Pham and Mr. Rajan Rajendran from Emerson Climate Technologies, the United States, evaluated the potential for the mildly inflammable R32 and the hydrofluoroolefins HFO-1234yf and HFO-1234ze in AC systems as a suitable R410A replacement. Results favoured R32 in terms of both efficiency and cost. R32 has theoretically 3-14 per cent higher capacity in the AC evaporating temperature range (7.2° to 12.8°C) and 7-16 per cent higher capacity in the heat pump evaporator temperature range (-23.3° to -34.4°C). Correspondingly, R32 has theoretically higher (-1 to +5 per cent) Energy Efficiency Ratio (EER) in the AC cooling temperature range and 0 to 7 per cent higher EER in the heat pump heating temperature range.

In practical drop-in tests in R410A systems, the actual relative compressor capacity was on average about 3 to 4 per cent lower than theoretical and the actual relative compressor EER was on average about 2 to 3 per cent lower than theoretical owing to lower overall isentropic efficiency. Optimizing the compressor and system for R32 could push the refrigerant towards achieving its theoretical potential as well as mitigating its higher compressor discharge temperature. The natural refrigerants carbon dioxide (CO_2) and propane too have not shown to be cost-effective solutions for mainstream ACs due to their low efficiency and/or inflammability safety reasons. R290 is limited to smaller units. HFOs are hampered by their relatively high costs, and no visible advantages over R32 were observed in these early drop-in system test results. The HFO blends are comparable to R32, but their use may be restricted until their cost position becomes clearer.

Source: www.acr-news.com

HFO1234ze propellant out of EPA's VOC list

The United States Environmental Protection Agency (EPA) has excluded Honeywell's HFO-1234ze propellant – Solstice™ – from the list of volatile organic compounds (VOCs). EPA based its decision on Solstice's low photochemical reactivity and negligible contribution to tropospheric ozone generation. The classification will help aerosol formulators develop products that meet the United States' VOC regulations, adding another key environmental benefit to the product's very low global warming potential. In the past, formulators had to choose between inflammable propellants like hydrocarbons and dimethyl ether, which have low global warming potentials (GWPs) but are VOCs, or a non-VOC, non-inflammable propellant, like HFC-134a, which has a higher GWP, stated Mr. Terrence Hahn, Vice President and General Manager of Honeywell Fluorine Products. Now Solstice propellant can claim two highly desirable properties – low GWP (6) and non-VOC – along with non-inflammability.

Solstice propellant is an alternative to HFC-134a and HFC-152a, two propellants in common use today (with GWPs of 1,430 and 124, respectively) as well as to inflammable hydrocarbon propellants. It can be used in various aerosol applications, such as personal and household care products, dusters, warning systems, industrial cleaners, novelty aerosol products and others. Honeywell's Solstice-brand products include refrigerants, liquid and gaseous blowing agents, and solvents that help customers lower the carbon footprint without sacrificing end product performance.

Source: www.honeywell-solstice-propellants.com

Dose indicator – an alternative to spray pump-based systems

In the United States, Zetonna™ (ciclesonide) nasal aerosol from Sunovion Pharmaceuticals Inc. is equipped with the Landmark® dose indicator from Aptar Pharma. The unique dose indicator actuator for the delivery of Zetonna offers an alternative to conventional spray pump-based systems.

Zetonna's dose indicator actuator is an alternative to spray pump

Zetonna is a dry nasal aerosol for the treatment of allergic rhinitis. The aerosol's delivery system is a non-aqueous, dry aerosol spray for daily use. Each Zetonna nasal aerosol canister contains enough medicine for 60 metered actuations for 30 days of treatment. The customized and convenient Landmark dose indicator counts downwards and provides the patient with a visual colour and numerical reference for refill of the prescription before the container becomes empty. The Landmark dose-counting mechanism is independent of the actuation force. *Contact: Ms. Patricia Moriarty, Sr. Director, Corporate Communications, Sunovion Pharmaceuticals Inc., 508-481-6700, 84 Waterford Drive, Marlborough, MA 01752, United States of America. Tel: +1 (508) 7874 279; E-mail: patricia.moriarty@sunovion.com.*

Source: www.packagingeurope.com

Aggregate particulate for powder aerosol compositions

Glaxo Group Limited, the United Kingdom, along with two inventors, has patented a method of making aggregate particles suitable for a powder aerosol composition. The method includes: (a) forming a dispersion of drug nanoparticles and/or excipient nanoparticles in a non-aqueous liquid, wherein both nanoparticles have a solubility of less than 10 mg/ml in the liquid dispersing media; and (b) spray-drying the dispersion of both nanoparticles to generate aggregate particles, wherein the drug and/or excipient nanoparticles have maintained their preselected crystalline form, and the aggregate particles have a mass median aerodynamic diameter of about 100 microns or less.

While any suitable carrier or diluent excipient material, or blend of materials, may be used, in one suitable embodiment, the excipient carrier or diluent particles are lactose, mannitol or starch. Such admixed formulation may possess beneficially enhanced delivery and dispersion efficiencies. This approach also may be used to further dilute high potency drugs, or in cases where further diluents are needed or desirable to allow for metering and/or dose adjustment. *Contact: Glaxo Group Ltd., Global Patents Department, Glaxo Wellcome House, Berkeley Avenue, Greenford, Middlesex UB6 0NN, United Kingdom.*

Source: www.sumobrain.com

Fighting fire with fine water mist

Mr. Angel Abbud-Madrid with the new portable fire extinguisher

A lightweight, inexpensive, non-toxic and recyclable portable fire extinguisher that uses water more efficiently and is less damaging to structures and electronics than a typical sprinkler system has been tested in the United States. Mr. Angel Abbud-Madrid, Director of the Centre for Space Resources (CSR), directed the extinguisher's initial development in collaboration with the National Aeronautics & Space Administration (NASA). In early 2012, the extinguisher passed the System Requirements Review at Johnson Space Centre.

All further design and testing are aimed at delivering a new fire suppression system for the International Space Station (ISS) by the end of 2013. Researchers at the Colorado School of Mines, where CSR is located, will help with unit design and carry out testing on campus, as well as on NASA's zero-gravity airplane, to determine the extinguisher's optimum configuration to put out an open fire inside an ISS module. The CSR researchers are working with ADA Technologies Inc. on product development and with Wyle Integrated Science and Engineering under NASA's bioastronautics contract to build 13 units that will replace the existing carbon dioxide extinguishers on the ISS. The new units must fit in the same space as the old ones. Once the installation on the ISS is complete, the technology can move from spacecraft to commercial applications. Possibilities include civil aircraft, passenger ships, military vehicles, subway systems and tunnels, museums and historical sites, health-care facilities and computer rooms.

Source: minesnewsroom.com

Total flooding clean agent engineered system

Fireboy, the United States, is a provider of on-board clean agent fire protection systems. Its total flooding clean agent systems suppress surface fires in Class A, B and C hazards. Fireboy fire extinguishing systems are specifically designed for protecting enclosures that are up to 500 m^3 in volume, such as engine rooms on boats. The FES system is an engineered system that utilizes a fixed nozzle agent distribution network. The system is designed and installed in accordance with the International Maritime Organization (IMO) Fire Safety Systems (FSS) Code.

When properly designed, the HFC-227ea fire extinguishant system suppresses surface burning fire in Class A, B and C hazards. About 80 per cent of fire fighting effectiveness of HFC-227ea fire extinguishant is achieved through heat absorption and 20 per cent through direct chemical means (action of the fluorine radical on the chain reaction of a flame). Complete suppression using HFC-227ea fire extinguishant has the following advantages:

- The low concentration of HFC-227ea fire extinguishant required means less visual obscurity and minimal risk to personnel;
- The small quantity of agent discharged minimizes over-pressurization of the protected area;
- Maximum safety for personnel due to low toxicity; and
- The ability to prevent re-ignition as long as concentration levels are maintained.

Contact: Fireboy-Xintex Inc., P.O. Box 152, Grand Rapids, Michigan, MI 49501 0152, United States of America. Tel: +1 (616) 7359 380; Fax: +1 (616) 7359 381.

Source: www.fireboy-xintex.com

Spherical system for Novec™ 1230 fire protection fluid

Clean agent suppression systems from Fenwal Protection Systems, the United States, provide a high safety margin with a 4.2 per cent use concentration. The Fenwal engineered system designed for use with 3M™ Novec™ 1230 fire protection fluid, the newest agent in halon alternatives. Novec 1230 has clear environmental benefits over any other halon alternative, such as a lower global warming potential and ozone depletion potential.

The Spherical Novec™ 1230 fluid system is ideal for use in applications where space is a constraint. The spherical system could be positioned in drop ceiling spaces that are often found in data centres and IT rooms. It has a minimal storage space (ideal for ceiling- or wall-mounted applications), and is safe and approved for use in occupied spaces. *Contact: Fenwal Protection Systems, #400 Main Street, Ashland, MA 01721, United States of America. Tel: +1 (508) 8812 000.*

Source: www.fenwalfire.com

Clean agent fire extinguishers

Unicare's UFS fire extinguisher

Unicare Fire Safety, India, offers UFS brand clean agent fire extinguishers. UFS clean agent fire extinguishers are premium fire fighting units that are very environment friendly and exceptionally effective. They use superior quality, flexible rubber hose to ensure ease of use. These systems, suitable for Class A, B and C fires, feature:

- Welded cylinders that are hydraulic tested up to 30 kg/cm^2, and duly hot-phosphated and epoxy powder-coated – internal and external – to more than 65 µm;
- Squeeze lever discharge valve is made of non-ferrous, chrome-plated metal;
- High quality pressure gauge with red and green indication;
- Plastic internal discharge tube;
- HFC-236 (FE36) clean agent gas from DuPont;
- Super pressurization by dry nitrogen gas; and
- Mild steel, powder-coated wall suspension brackets.

Contact: The Manager, Unicare Fire Safety India Pvt. Ltd., C-35, Sector 65, Noida 201 301, Uttar Pradesh, India. Tel: +91 (120) 4220726732.

Source: www.indiamart.com

Fire suppression with Novec™ 1230 fire protection fluid

DAFO Fomtec AB, Sweden, offers fire suppression systems based on 3M™ Novec™ 1230 fire protection fluid. The cylinder valves are of a pressure-seated high flow rate design, to meet the rapid discharge time specified in the United States' National Fire Protection Association (NFPA) 2001 Standard. Each has a brass body, a brass piston with resilient seat, a pressure releasing pilot check, a safety disc assembly, a pressure gauge and an electric solenoid valve. This relieves the pressure above the piston and permits the piston to travel upwards, thus fully opening the valve and permitting the agent to discharge through the outlet.

The discharge outlet is fired with an anti-recoil plug, a safety device to prevent violent movement of the cylinder in the event of discharge while the cylinder valve is not connected to the piping system structure. *Contact: DAFO Fomtec AB, Sweden. Tel: +46 (8) 5064 0566; Fax +46 (8) 5064 0529; E-mail: info@fomtec.com.*

Source: www.fomtec.com

High-pressure water mist system

Marioff Corporation OY, Finland. offers HI-FOG® high-pressure water mist fire protection system as a substitute for deluge, gas, foam, dry chemical, traditional sprinkler and other types of fixed fire protection system. HI-FOG is claimed to be efficient against most types of fires. It controls, suppresses and extinguishes fires by discharging a fine water mist at high velocity. The water mist is made by the system when it activates: it pushes the water at high pressure through specially designed, patented spray and sprinkler heads. The water mist is discharged by high-pressure pumps or accumulators.

HI-FOG uses three mechanisms to fight fire: cooling, radiant heat blocking and local oxygen inerting. The small droplets vaporize very fast and, when doing so, absorb heat very efficiently. At the same time, the water mist expands 1,760 times, displacing the oxygen at the seat of the fire. Traditional sprinkler systems use wetting as their main mechanism, and therefore use very large amounts of water. In contrast, HI-FOG uses water much more efficiently: up to 90 per cent less water than traditional sprinkler systems for the same application with equivalent or better performance. *Contact: Marioff Corporation OY, PO Box 86, Virnatie 3, FI-01301 Vantaa, Finland. Tel: +358 (10) 6880 000; Fax: +358 (10) 6880 010; E-mail: info@marioff.fi.*

Source: www.marioff.com

Innovative online tool to enforce Ozone Treaty through informal means

United Nations Environment Programme has released an online version of Informal Prior Informed Consent on Trade of Ozone Depleting Substances (iPIC).

The system is now available to National Ozone Units and their responsible authorities at: http://www.unep.org/ozonaction/ipic.

For more information, contact:

Mr. Saiful Ridwan
eGroup Coordinator
UNEP OzonAction Programme
Tel: +33 (1) 4437 1624
E-mail: saiful.ridwan@unep.org

Polyurethane foaming process

Arkema Inc., the United States, is patenting a method of producing polyurethane (PU) foams that have uniform density distribution along their flow pathway before they are solidified and enhanced processing efficacy. More specifically, the invention comprises mixing an unsaturated halogenated hydroolefin blowing agent and other PU premix components, and using high-pressure mixing and dispensing equipment of reaction injection moulding to produce the foam. The foam processing efficacy was characterized by means of: minimum fill weight in a mould; core density, average density and density distribution in the flow path; compression strength of the foam; dimensional stability of the foam; and thermal conductivity of the foam.

An important aspect of the invention is the use of blowing agents with negligible (low or zero) ozone-depletion and low global warming potential, in combination with one or more polyol, silicone surfactant, carbon dioxide generating agent, amine catalyst, etc. The blowing agent comprises an unsaturated halogenated hydroolefin, such as hydrofluoroolefins (HFOs) or hydrochlorofluoroolefins (HCFOs).

It was found that liquid PU foam prior to solidification flowed more uniformly than others, which was surprising based on its boiling point and relative solubility in the polymer premix. The resulting polymer along the flow path showed much narrower density variation defined by overall minus core density – from 1.6 to 10.4 kg/m^3, preferably 2.4 to 8.0 kg/m^3 and even more preferably from 3.2 to 7.2 kg/m^3.

Source: www.freepatentsonline.com

Water-blown bio-based thermoplastic polyurethane foams

A group of researchers in France has developed water-blown, bio-based thermoplastic polyurethane (TPU) formulations to fulfil the requirements of reactive rotational moulding/foaming process. These formulations were prepared using synthetic and bio-based chain extenders. Foams were prepared by mixing polyether polyol (macrodiol), chain extender (diol), surfactant (silicone oil), chemical blowing agent, catalyst and diisocyanate.

The researchers from Ecole des Mines de Douai and Université Lille Nord de France varied the concentration of chain extender, blowing agent and surfactant, and their effects on foaming kinetics and physical, mechanical and investigated morphological properties of resulting foams. Density, compressive strength and modulus of foams decrease with increasing blowing agent concentration and increase with increasing chain extender concentration. Changes in surfactant concentration had no significant effect. The foam glass-transition temperatures increase with increasing blowing agent and chain extender concentrations. The foam cell size slightly increases with increasing blowing agent content and decreases upon surfactant addition (without any dependence on concentration), whereas chain extender concentration does not affect cell size. Bio-based 1,3-propanediol can be used successfully for producing TPU foams without sacrificing any properties.

Contact: Ms. Marie France Lacrampe, Department of Polymers and Composites Technology and Mechanical Engineering, Ecole des Mines de Douai, 941 rue Charles Bourseul, BP 10838, F-59508 Douai Cedex, France. E-mail: marie-france.lacrampe@mines-douai.fr.

Source: onlinelibrary.wiley.com

Customers give thumbs up for Formacel 1100

DuPont, with its headquarters in the United States, is moving forward with the commercialization of its Formacel® 1100 (FEA-1100), a foam expansion agent with zero ozone depletion potential (ODP) and a low global warming potential (GWP) of 8.9, following customer feedback from global evaluation indicated significant improvement in performance. Formacel 1100 has no volatile organic compounds (VOCs) and has an atmospheric lifetime of just 22 days. Other notable features include low toxicity, non-inflammability, a low thermal conductivity of 10.7 mW/mK (at 25°C) and a suitable boiling point of 33°C.

Formacel 1100 foams showed 7 per cent improved k-factor when used as equal molar drop-in to 70:30 hydrofluorocarbon (HFC-245fa:HFC-365mfc) spray foam formulation, and foam sprayed using a spray machine. As spray foam, other foam properties – such as dimensional stability, compressive strength and bending strength – compared favourably with those of 70:30 HFC. In addition, customers reported usage of less Formacel 1100 to achieve the same level of improvement as HCFC-141b. Yet another important feature is that Formacel 1100 permits the usage of water and cyclopentane for level adjustment. Dupont reports that at reduced levels, the blowing agent can provide improved insulation performance.

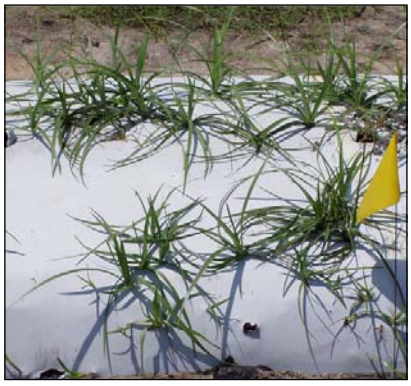
Source: www2.dupont.com

Soil fumigation after methyl bromide

The quest for alternatives to methyl bromide (MeBr) has seen hundreds of trials being conducted in the United States to examine the efficacy of different soil fumigants on soil-borne pests and weeds. Purple (*Cyperus rotundus*) and yellow (*C. esculentus*) nutsedge are the most troublesome weeds to control in polyethylene-mulched vegetable crops and have the ability to emerge through the mulch, causing yield and quality losses. Various reports have suggested that performance of drip-applied metam fumigants against nutsedge can improve by its application in concentrations that expose sprouting tubers to lethal rates.

At the University of Florida, studies were conducted in deep, sandy soil to assess the influence of metam potassium concentrations on *C. rotundus* control. The soil was low in organic matter (~1 per cent) and had a pH of 7.3. Selected fields had heavy *C. rotundus* infestation (~15 plants/ft^2). Planting beds were 8 in (h) × 28 in (w) and covered with low-density polyethylene mulch. Two drip irrigation lines were buried 1 in deep in the bed centre under the mulch film. Irrigation emitters were 1 ft apart. Besides drip irrigation, continuous sub-surface irrigation maintained the water table at 1½ ft deep to reduce water stress on weed populations. The applied metam potassium concentrations were 2,000, 3,000, 4,000, 5,000 and 6,000 ppm. A non-fumigated control was added.

Results indicate that metam potassium concentrations affected weed densities 4, 6 and 10 weeks after treatment (WAT). In 4 WAT, purple nutsedge densities decreased as metam potassium concentrations increased, with a maximum weed



Nutsedge sprouting through white polyethylene mulch

density of 12 plants/ft^2 when no fumigant was applied and declining to 3.5 and 1 plants/ft^2 when metam potassium concentrations reached 3,000 and 6,000 ppm, respectively. Two weeks later, a similar relationship between metam potassium concentration and the weed densities persisted. However, in the non-fumigated control, weed density reached 23 plants/ft^2 and decreased to 9 and 4 plants/ft^2 with 3,000 and 6,000 ppm, respectively. A linear regression model on metam potassium applied concentrations at 10 WAT showed approximately 42 per cent and 85 per cent weed control. *Contact: Prof. Bielinski M. Santos, Assistant Professor, Horticultural Sciences Department, UF/IFAS Gulf Coast Research and Education Centre, Wimauma, FL 33598, United States of America.*

Source: edis.ifas.ufl.edu

Vibro-thermal disinfestor

Fumigation as a means of disinfestation of insect pests on grains is not eco-friendly, as the fumigants used are mostly ozone depleting substances, and could leave toxic residues in the food grains. Thermal disinfestation of food grains can be a simple alternative. Bhabha Atomic Research Centre (BARC), India, has developed vibro-thermal disinfestor (VTD), a simple electric device for disinfesting food grains.

In all their development stages, insects are susceptible to killing when exposed to temperatures of 55° to 600°C for 30 minutes. VTD has been tested to achieve a shelf-life extension up to one year for food grains. It has a capacity of 40 kg/hour and a power consumption of 1 kWh. The mobile system is amenable for scaling up. Importantly, the treatment has no effect on germination of seeds. *Contact: Head, Technology Transfer and Collaboration Division, Bhabha Atomic Research Centre, Trombay, Mumbai 400 085, India. Tel: +91 (22) 2559 3897; Fax: +91 (22) 2550 5151, 2551 9613; E-mail: headttcd@barc.gov.in.*

Source: www.barc.ernet.in

Post-harvest fumigation using methyl iodide

Along with five inventors, Honeywell International Inc., the United States, is patenting technology relating to fumigant compositions and fumigation processes, particularly to fumigation processes for perishable products. The fumigant compositions comprise an azeotropic and azeotrope-like composition of methyl iodide and at least one fluorocarbon or hydrofluorocarbon. In one aspect, a method of fumigating a perishable product involves applying a gaseous fumigant composition at temperatures of 0° to 50°C to the product.

The fumigant composition has a density from about 1.5 to 2.4 g/cc. The fluorocarbon/hydrofluorocarbon in the fumigant composition has an average ozone depletion potential of about 0.05 or less and a global warming potential of about 1,000 or less. *Contact: Honeywell*

International Inc., Patent Services, 101 Columbia Road, P.O. Box no. 224, Morristown, NJ 07962-2245, United States of America.

Source: www.sumobrain.com

Evaluation of anaerobic soil disinfestation

Anaerobic soil disinfestation (ASD) is a non-chemical, pre-plant soil treatment developed for controlling soil-borne plant pathogens, plant-parasitic nematodes and weed populations in specialty crop production systems. ASD forms one of the non-methyl bromide method for soil disinfestation. Soil treatment by ASD involves the incorporation of a labile carbon source, tarping with plastic and irrigation of the topsoil to saturation (~5 cm irrigation) to create favourable conditions for anaerobic decomposition of the added carbon source.

Researches at the University of Tennessee, the United States, implemented a field study to assess potential carbon sources for ASD prior to production of fresh market tomato *(Solanum lycopersicum)* and bell pepper *(Capsicum annum)*. Carbon sources included dried molasses (5.6 mg/ha), cereal rye *(Secale cereale)* cover crop residue (9.3 mg/ha), cereal rye residue supplemented with dried molasses (1.1 mg/ha), mixture of mustard *(Brassica juncea* and *Sinapsis alba)* and arugula *(Eruca sativa)* cover crop residue (5.8 mg/ha), mixture of mustard/arugula cover crop residue supplemented with dried molasses (1.1 mg/ha), mustard seed meal (2.2 mg/ha, biofumigant control) and an untreated control. Plots (22.3 m^2) were in a randomized complete block design.

Following incorporation of amendments and cover crops, raised beds were formed in the centre of each plot and irrigated. Treatment continued for three weeks, during which time soil redox potential, soil temperature and soil moisture were continuously monitored. After treatment, tomato and bell pepper were transplanted on half of each plot, and treatment impacts on yield, plant nutrition, soil fertility, weed control and plant disease evaluated. Accumulation of anaerobic conditions was highest ($P < 0.05$) in the treatments that had cereal rye residue as a carbon source and lowest in the untreated and biofumigant controls. Weed populations were low throughout the study. Marketable crop yields did not differ among treatments, suggesting that pathogen and weed pressure were not high enough at this site to properly evaluate ASD treatment. *Contact: Mr. D. Grant McCarty, Department of Plant Sciences, University of Tennessee, Knoxville, TN 37996-4561, United States of America.*

Source: ashs.confex.com

Fumigant activity of leaf essential oil

The fumigant toxicity of essential oil from *Myrtus communis* (L.) leaf was assessed against the beetle *Trogoderma granarium Everts* by researchers in Syria. The essential oil was active against different life stages of *T. granarium.* Adult stage was the most sensitive of all developmental stages to essential oil vapours. Larvae were the most tolerant, with 94 per cent and 100 per cent mortality obtained after exposure of larvae to 562.5 µl/l air for 24 h and 48 h, respectively.

Results suggest a possibility for using the essential oil as an insecticide against *T. granarium* in grain stores. *Contact: Mr. Ghaleb Tayoub, Department of Molecular Biology and Biotechnology, Atomic Energy Commission of Syria, Damascus, P.O. Box 6091, Syria. Tel: +963 (11) 2132 580; Fax: +963 (11) 6112 289.*

Source: www.openaccessscience.com

Broad-spectrum soil fungicide for strawberries

AgraQuest Inc., the United States, has announced the approval of its broad-spectrum soil fungicide for strawberry crops in California, the United States. Serenade Soil is a unique soil fungicide combining control on important yield-robbing diseases with root colonization and plant growth effects. When applied at planting, Serenade Soil first attacks soil-dwelling pathogens, and then quickly builds a disease protection zone around the seedling's roots. As the seedling grows, the beneficial bacteria in Serenade Soil continue to grow, attaching themselves to the roots of the plant to protect the plant during the season, and results in higher yields of quality produce. The recently approved label will allow applications for control of *Verticillium*. The company plans for the label for Serenade Soil to be expanded to include additional strawberry diseases in the future.

In 2012 field trials, the product will continue to be evaluated for its effects on *Phytophthora* and *Fusarium*. Since the product is widely tank-mix compatible, expanded trials will also focus on integration of Serenade Soil with weed and insect control products. *Contact: AgraQuest Inc., 1540 Drew Avenue, Davis, CA 95618, United States of America. Tel: +1 (530) 750 0150; Fax: +1 (530) 750 0153.*

Source: agraquest.com

Methylal as Blowing Agent in the Manufacture of Polyurethane Foams

This report was prepared by UNDP based on the results of a project funded by the Multilateral Fund for the Implementation of the Montreal Protocol. There is an urgent need to assess potential alternative technologies for replacing HCFC-141b in terms of properties, costs, availability, sustainability and environmental performance. Decision 55/43 by the Executive Committee of the Multilateral Fund (ExCom) for the Implementation of the Montreal Protocol reflects this by promoting pilot projects aimed at validating technologies in a developing country (A5) context. This report analysed the viability and potential of using methylal as HCFC alternative in polyurethane foam on the basis of trials and pilots at Arinos Quimica Ltda in Sao Paulo, Brazil, which produces polyurethane systems.

Low-cost Options for the use of Hydrocarbons in the Manufacture of Polyurethane Foams

The need to assess alternative technologies for replacing HCFC-141b – in terms of properties, costs, availability, sustainability and environmental performance – has become urgent. The Executive Committee of the Multilateral Fund (ExCom) for the Implementation of the Montreal Protocol, by its Decision 55/43, reflects urgent need by promoting pilot projects aimed at validating such technologies in developing countries. This report analysed the potential and viability of using hydrocarbons as HCFC alternative in polyurethane foam. Hydrocarbon technology is available worldwide, but its implementation requires large capital outlays to ensure safety. On the other side, the operating costs are generally somewhat lower than HCFCs. This pilot project aimed to evaluate available options to lower the capital costs without compromising safety or operating costs. This report was prepared by UNDP based on the results of a project funded by the Multilateral Fund for the Implementation of the Montreal Protocol.

For the above publications, *contact: United Nations Development Programme (UNDP), One United Nations Plaza, NY 10017 United States of America. Tel: +1 (212) 9065 000; E-mail: publications.queries@undp.org.*

06-08 Nov
Orlando
United States

Annual International Research Conference on Methyl Bromide Alternatives & Emissions Reductions
Contact: Methyl Bromide Alternatives Outreach, 6556 N. Dolores Avenue, Fresno, CA 93711, United States of America.
Tel: +1 (559) 449 9035;
Fax: +1 (559) 449 9037.

07-10 Nov
Pasay City
Philippines

HVAC/R PHILIPPINES 2012
Contact: Global-Link Marketing and Management Services Inc., Unit 1003, Antel 2000 Corporate Centre, 121 Valero Street, Salcedo Village, Makati City, The Philippines.
Tel: +63 (2) 750 8588;
Fax: +63 (2) 750 8585;
E-mail: info@globallinkmp.com;
Website: globallinkmp.com.

08-09 Nov
Kobe
Japan

International Symposium on New Refrigerants and Environmental Technology 2012
Contact: Kobe Symposium 2012 Secretariat, Kinkinippon Tourist Co. Ltd., Global Business Management Branch, 12F Sumitomo-shoji, Kanda-Izumi-cho Building, 1-13, Kanda-Izumi-cho, Chiyoda-ku, Tokyo, 101-0024 Japan.
Tel: +81 (3) 6891 9600;
Fax: +81 (3) 6891 9599;
E-mail: jraia2012-gbm@or.knt.co.jp.

08-10 Nov
Shanghai
China

China International Auto Air-conditioning & Refrigeration Exhibition 2012
Contact: Shanghai Gehua Exhibition Service Co. Ltd., Rm. 1206-1208, Xin'an Building, 10/F, Yindu Mansion, No. 99 Tianzhou Road, Shanghai, 200233 China.
Tel: +86 (21) 5445 1166;
Fax: +86 (21) 5445 1968.

12-16 Nov
Geneva
Switzerland

24th Meeting of the Parties to the Montreal Protocol
Contact: Ozone Secretariat, United Nations Environment Programme (UNEP), United Nations Avenue, Gigiri, P.O. Box 30552, Nairobi 00100, Kenya.
Tel: +254 (20) 762 3851;
Fax: +254 (20) 762 0335;
E-mail:ozoneinfo@unep.org.

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BOOKS

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