VATIS UPDATE

Ozone Layer Protection

Vol. 4 No. 105 • Mar - Apr 2011
ISSN 0971-5657

Highlights

- Promising future for electric field refrigeration
- Game-changing AE2 compressor
- Paint and powder coating stripper
- Improved polyurethane rigid foam system
- Innovative dispenser technology
- Reactive films to limit methyl bromide emissions

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

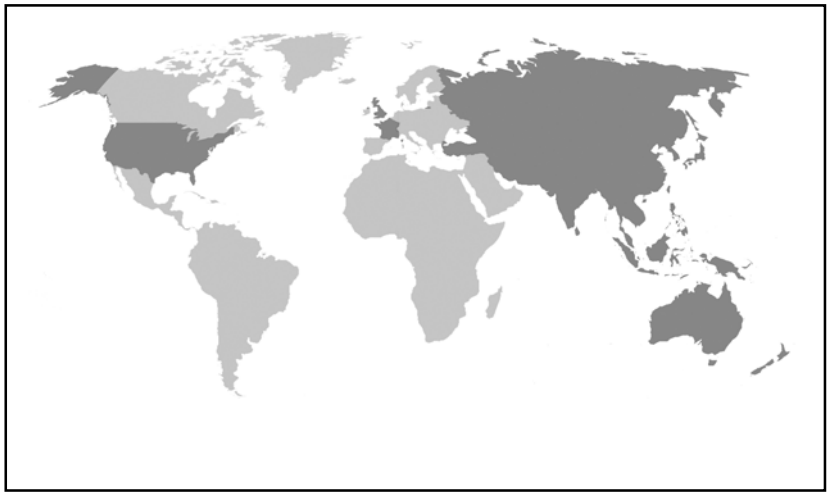
APCTT
ASIAN AND PACIFIC CENTRE FOR TRANSFER OF TECHNOLOGY

OZONE CELL
MINISTRY OF ENVIRONMENT AND FORESTS
GOVT. 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

Soil scientist Dr. David Butler collects a soil sample for nutrient analysis and eggplant pathogen population assessment.

(Credit: Peggy Greb, United States Department of Agriculture)

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

ASIAN AND PACIFIC CENTRE FOR TRANSFER OF TECHNOLOGY
Adjoining Technology Bhawan
Qutab Institutional Area
Post Box No. 4575
New Delhi 110 016, India
Tel: (91) (11) 2696 6509
Fax: (91) (11) 2685 6274
E-mail: postmaster@apctt.org
Website: http://www.apctt.org

OZONE CELL
Ministry of Environment and Forests
Government of India
Zone IV, East Court, 2nd Floor
India Habitat Centre, Lodhi Road
New Delhi 110 003, India
Tel: (91) (11) 2464 2176
Fax: (91) (11) 2464 2175
Telegram: PARYAVARAN NEW DELHI
E-mail: ozone-mef@nic.in
Website: http://www.ozonecell.com

*** Value Added Technology Information Service**

CONTENTS

Vol. 4 No. 105 Mar - Apr 2011

SCIENCE OF THE OZONE LAYER

3D model evaluation of solvents

The existing solvents trichloroethylene (TCE) and perchloroethylene (PCE) and proposed solvent n-propyl bromide (nPB) contain chlorine or bromine that could affect stratospheric ozone. Several previous studies had estimated the ozone depletion potentials (ODPs) for various assumptions of nPB emissions location, but employing simplified modelling treatments.

Scientists from the United States and the Republic of Korea have launched a study with the primary purpose of re-evaluating the ODP for nPB using a three-dimensional (3D), atmospheric chemistry-transport model of the troposphere and stratosphere. The researchers from University of Illinois at Urbana-Champaign and Purdue University in the United States, and Seoul National University in the Republic of Korea, evaluated ODPs of TCE and PCE for the first time. Emissions representing industrial use of each compound are incorporated on land surfaces from 30°N to 60°N. The atmospheric chemical lifetime obtained for nPB is 24.7 days, similar to past literature, but the ODP is 0.0049, lower than found in the past. The derived atmospheric lifetime for TCE is 13.0 days and for PCE is 111 days. The corresponding ODPs are 0.00037 and 0.0050, respectively. *Contact: Dr. D.J. Wuebbles, Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States of America.* (Source: www.atmos-chem-phys.org)

Record loss of stratospheric ozone in the Arctic

Depletion of the ozone layer has reached an unprecedented level over the Arctic in the spring of 2011 because of the continuing presence of ozone depleting substances in the atmosphere and a very cold winter in the stratosphere, the second major layer of the Earth's atmosphere. While the degree of Arctic ozone destruction in 2011 is unprecedented, it is not unexpected. Scientists had foreseen the possibility of significant Arctic ozone loss in the case of a cold and stable Arctic stratospheric winter. Stratospheric ozone depletion occurs over the polar regions when temperatures drop below -78°C, forming clouds in the stratosphere. Chemical reactions that convert innocuous reservoir gases (such as hydrochloric acid) into active ODS take place on the clouds' particles. The result is rapid destruction of ozone if sunlight is present.

Mr. Michel Jarraud, Secretary-General, World Meteorological Organization (WMO), states: "The degree of ozone loss experienced in any particular winter depends on the meteorological conditions. The 2011 ozone loss shows that we have to remain vigilant and keep a close eye on the situation in the Arctic in the coming years." The Global Atmosphere Watch Network of WMO has many stations in the Arctic and helps obtain an early warning in case of low ozone and intense ultraviolet (UV) radiation. If the ozone depleted area moves away from the pole towards lower latitudes, one can expect increased UV radiation compared with the normal for the season. As the solar elevation at noon increases, regions affected by the ozone depletion will experience higher than normal UV radiation. *Contact: Mr. Carine Richard-Van Maele, Chief, Communications and Public Affairs, World Meteorological Organization, Switzerland. Tel: +41 (22) 730 8315; Mobile: +41 (79) 406 4730; E-mail: cpa@wmo.int.* (Source: www.wmo.int)

Environmental consequences of residual CFCs in obsolete household refrigerators

Chlorofluorocarbons (CFCs) contained in household refrigerators consist mainly of CFC-11 and CFC-12. Releases of these refrigerants into the environment deplete ozone and contribute significantly to the greenhouse effect. Researchers at the Department of Environmental Science & Engineering of Tsinghua University in China have studied the potential release of residual CFCs and their substitutes from obsolete household refrigerators in the country. They also compared the ozone depletion potential and greenhouse effect of these gases with those of other known ozone depleting substances (ODS) and greenhouse gases (GHGs).

The findings imply that annual potential amounts of released residual CFC-11 and CFC-12 will peak at 4,600 t and 2,300 t, respectively, in 2011, and then decrease gradually to zero until 2020. Meanwhile, the amounts of the most used substitutes HCFC-141b and HFC-134a will keep increasing. The contribution ratio of the CFCs and their substitutes to ozone depletion will remain at 25 per cent through 2011 and reach its peak value of 34 per cent by 2018. The contribution to greenhouse effect will reach its peak value of 0.57 per cent by 2010. Moreover, the contribution ratio of these CFCs to the total global CFC release will increase steadily, reaching a peak of 15 per cent by 2018. The 2010-2018 period is thus crucial, as residual CFCs and their substitutes from obsolete refrigerators in China will be contributing significantly towards ozone depletion. *Contact: Mr. Zhao X/Mr. Duan H/Mr. Li J, Department of Environmental Science and Engineering, Tsinghua University, Beijing, China.* (Source: www.ncbi.nlm.nih.gov)

Arctic ozone depletion from unusually low temperatures

European Union researchers have found that unusually low temperatures in the Arctic ozone layer have triggered large-scale ozone depletion. The study was funded by the 'Reconciliation of essential process parameters for an enhanced predictability of Arctic stratospheric ozone loss and its climate interactions' project (RECONCILE). The project, coordinated by the Potsdam Research unit of the Alfred Wegner Institute for Polar and Marine Research in the Helmholtz Association (AWI), Germany, involved 16 research institutions from 8 nations and over 30 ozone sounding stations situated all over the Arctic and Sub-Arctic. The overall aim is to clearly understand the details of the complicated relationship between the ozone layer and climate change. The project uses a comprehensive approach that includes laboratory and field experiments together with microphysical and chemical transport modelling. By producing and testing reliable parameters of key processes in Arctic ozone layer depletion and bridging them to large-scale chemistry climate models (CCMs), the researchers aim to increase their chances of making realistic predictions about the future evolution of Arctic ozone layer loss and its interaction with climate change. (Source: cordis.europa.eu)

ODS PHASE-OUT IN INDIA

Phase-out of CFCs in MDI manufacturing

In India, the National Strategy for Transition to Non-Chlorofluorocarbon Metered Dose Inhalers (MDIs) and the Plan for the Phase-Out of Chlorofluorocarbons (CFCs) in the Manufacture of Pharmaceutical MDIs by 2012 was approved by the 56th Executive Committee (ExCom) of the Multilateral Fund in November 2008, with a funding of US$10.2 million. The Strategy is being implemented by the United Nations Development Programme (UNDP), as the lead agency, and the United Nations Environment Programme (UNEP) and Government of Italy, as cooperating agencies. Quota order for production of 343.6 t of pharma-grade CFC for 2010 was issued by the Ministry of Environment and Forests (MoEF) for manufacturing MDIs under the Essential Use Nomination (EUN). The implementation of the Strategy is progressing well, and the country has not sought any EUN for 2011. (Source: www.ozonecell.com)

United Nations approves new small-scale HFC project

The United Nations has approved a project titled "Avoidance of HFC-134a Emissions in Rigid Polyurethane Foam (PUF)" under the Clean Development Mechanism (CDM) process to mitigate climate change. This is only the third project of its kind ever registered under the CDM's "AMS III N" methodology. The project, located at Murbad village in Maharashtra, is being developed by Rinac India Ltd. It will be awarded carbon credits for using pentane as a blowing agent in rigid polyurethane foam (RPUF) panels manufacturing in place of HFC-134a. HFC-134a is a greenhouse gas contributing to global warming and has a global warming potential of 1300 compared with carbon dioxide's potential of 1. The project has been approved to annually earn 15,282 carbon credits that are worth 170,000 euros (Rs 102 million) at current market prices in Europe. (Source: www.climate-connect.co.uk)

IN THE NEWS

Funding to phase out HCFCs in 39 countries

During its 63rd Meeting in Montreal, Canada, held during 4-8 April 2011, the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol agreed to commit over US$40 million to phase out nearly 400 ozone depletion potential (ODP) tonnes of hydrochlorofluorocarbons (HCFCs) in 39 developing countries, which include Afghanistan, Bhutan, Islamic Republic of Iran, Kyrgyzstan, Lao People's Democratic Republic, Mongolia, Papua New Guinea, Timor-Leste, Viet Nam and the 12 Pacific Island Countries (PICs) on a regional basis. HCFCs are being used in these countries mainly as refrigerants in air-conditioners and industrial and commercial refrigeration, as a blowing agent for the manufacture of foam and, to a lesser extent, as solvents.

The assistance from the Multilateral Fund will support the countries to implement HCFC phase-out management plans (HPMPs) that meet the specific phase-out targets set by the Montreal Protocol. While 27 of these countries will each implement an individual HPMP, the 12 PICs will implement one HPMP for the entire sub-region of small island countries. The regional approach aims not only to facilitate HCFC phase-out in the PICs but also to be the most cost-effective use of funds. All 39 countries have pledged to freeze HCFC consumption by 2013 and effect 10 per cent reduction by 2015, while 25 countries with low HCFC consumption intend to achieve the 35 per cent HCFC reduction target by 2020. While most countries will have a stepwise approach to phase out HCFCs and address the total phase-out in a subsequent stage of their HPMPs, the Executive Committee approved HPMPs for five countries including Bhutan and Papua New Guinea to completely phase out HCFCs well in advance of the 2040 deadline. *Contact: Ms. Julia Anne Dearing, Information Management Officer, Secretariat of the Multilateral Fund, #1000, De La Gauchetiere Street West, Montreal, Quebec, H3B 4W5, Canada. Tel: +1 (514) 2821 122; Fax: +1 (514) 2820 068; E-mail: secretariat@unmfs.org.* (Source: www.multilateralfund.org)

Roy Family Award for Refrigerants, Naturally!

The Harvard Kennedy School (HKS), the United States, has announced that the 2011 Roy Family Award for Environmental Partnership will be given to Refrigerants, Naturally! – an alliance of corporations that is substituting environmentally harmful fluorinated gases with natural refrigerants – such as ammonia, carbon dioxide and hydrocarbons – in their commercial refrigeration installations. The award is presented every two years to celebrate an outstanding public-private partnership project that enhances environmental quality through the use of novel and creative approaches. It will be presented to the recipients at an HKS event later this spring. Refrigerants, Naturally! brings together four high-profile private companies – Coca-Cola Company, McDonald's, Unilever and PepsiCo – and two international environmental organizations – Greenpeace and the United Nations Environment Programme – to combat climate change and ozone layer depletion by developing natural refrigeration technologies that are safe, reliable, affordable and energy efficient. (Source: www.physorg.com)

Kazakhstan ratifies amendments to Montreal Protocol

Kazakhstan President Mr. Nursultan Nazarbayev has signed a law on ratification of the amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer. The Protocol was adopted on 25 November 1992, while the Amendments to the Protocol were adopted during 15-17 September 1997. The text of the new law has been published in the press. (Source: en.trend.az)

Philippines to ensure car air-conditioners are ozone friendly

The Philippines will not register vehicles with air-conditioning systems that use ozone depleting substances (ODS) starting 1 January 2012. Such imports have already been banned since January 2010 in compliance with the country's commitment to the Montreal Protocol. To avoid registration problems and penalties from next year on, vehicle owners must have their ODS-containing

mobile air-conditioning (MAC) systems converted to ozone-friendly systems by service shops accredited by the Department of Trade and Industry (DTI). The conversion of MAC systems to hydrocarbons is being promoted by the Department of Environment and Natural Resources (DENR) and the Philippines Ozone Desk (POD). DENR has also been distributing free tools and equipment, amounting to about 1,500 euros (100,000 pesos), to service shops to prepare them for the recovery of CFCs and for servicing ozone-friendly MAC systems. (Source: www.hydrocarbons21.com)

Dow joint venture could aid non-ozone depleting refrigerants

The Dow Chemical Co. in the United States, and Befar Group Co. Ltd. of China plan to create a 50-50 joint venture to produce perchloroethylene (PCE), a major building block material for non-ozone depleting refrigerants used in industrial, automotive, consumer, commercial, building and construction, and other applications. Under the Memorandum of Understanding, the two companies will explore development of a world-scale PCE manufacturing facility in Binzhou, Shandong province, China. The new facility would have an initial target capacity of 40,000 t/y, with the ability to double production to 80,000 t/y soon thereafter. Production is estimated to begin in 2014. The demand for PCE as a feedstock is increasing in China and across the world. The proposed Dow-Binhua joint venture is designed to meet this significant market opportunity. (Source: www.ourmidland.com)

Sri Lankan plan for HCFC phase-out

The Hydrochlorofluorocarbons (HCFCs) Phase-out Management Plan (HPMP) for Sri Lanka was announced at a recent inception ceremony. The plan, prepared in collaboration with the United Nations Development Programme (UNDP) under the guidance of the Environment Minister and Incumbent Chairman of Vienna Convention Mr. Anura Priyadarshana Yapa, will be implemented gradually from 1 January 2013.

Member states of the Montreal Protocol have agreed to complete HCFC phase-out by 2030. Sri Lanka hopes to accomplish the HCFC phase-out target by 2025 following strategic action plans. “We have successfully phased out chlorofluorocarbons (CFCs) by 2007 and other major ozone depleting substances by 2010. Sri Lanka has promoted HCFC systems as substitutes to CFCs throughout these years. Therefore, the consumption (of HCFCs) has been increasing during the past many years. Since we have agreed to advance the phase-out dates it is very important that we provide necessary assistance to stakeholders. Therefore, we need to discuss today the most economically viable and accessible proven new technology as an alternative to HCFC,” Mr. Yapa observed. Mr. Douglas Keh, UNDP Country Director and Resident Representative, noted that Sri Lanka is taking a leadership role in key global environment issues. (Source: www.dailynews.lk)

Use of HCFCs in manufacturing process suspended in Taiwan

The Environment Protection Agency (EPA) of Taiwan province of China has not only revised the national hydrochlorofluorocarbons (HCFCs) reduction target from 65 per cent to 75 per cent off the baseline by 2010, but also added new articles for the time-frame of suspending HCFCs use in different sectors starting from 2010. Moreover, from 2011, new regulations will be applied on stopping the use of HCFC-141b in producing low-temperature isolated rigid polyurethane (RPU) foam, cleaning process in microwave and satellite communication products. Beginning 2011, Taiwan has also stopped using HCFC-22 refrigerant in air-conditioners below 7.1 kW. This is the first time HCFCs are being prohibited in refrigerant applications in Taiwan. Violations will attract a fine of US$3,000-US$33,000 under Article 59 of the Air Pollution Control Act. In certain serious cases, violators may face suspension or termination of business. Import/export of HCFCs will require permits from the Taiwan EPA.

Imports of equipment and products containing HCFC-141b and HCFC-22 are also prohibited from 1 January 2011. Violators may be penalized with six months to five years imprisonment and fines of US$9,000-US$50,000. According to the Montreal Protocol and Taiwan’s HCFCs management regulations, the HCFCs quota will be cut

back 90 per cent in 2015, and 99.5 per cent in 2020. It means only 3,191 ozone depletion potential (ODP) kilograms will be allowed for allocation in 2020; and it will be limited for maintenance purposes for existing chillers and air-conditioners that are in operating status. The Taiwan EPA will continue to research alternative technologies and assess their economic feasibility for local industries to plan advanced steps for HCFCs reduction. (Source: www.saveoursky.org.tw)

ODS in Thailand

The Department of Agriculture (DOA), Thailand, has received a grant fund under the Montreal Protocol to implement a project called Thailand National Methyl Bromide Phase-out Plan (NMBPP) through the World Bank. A Project Management Unit (PMU) was established to implement and monitor activities under NMBPP.

One of the activities under NMBPP is to strengthen capacity of owners of storage facilities to adopt methyl bromide alternatives through training on the use of alternatives and through provision of financial subsidy for acquisition of equipment for integrated pest management (IPM) and basic fumigation through voucher scheme. Around 150 sets of IPM equipment and 75 sets of fumigation equipment will be procured for enterprises across Thailand, who will purchase the equipment from equipment suppliers accredited by DOA. *Contact: Project Management Unit, Office of Agricultural Regulation, Department of Agriculture, 50 Phahonyothin Road, Ladyao, Chatuchak, Bangkok 10900, Thailand. Tel: +66 (2) 9406 958; Fax: +66 (2) 9406 958; E-mail: thailandmb@yahoo.com.* (Source: www.devex.com)

Consulting service on root-knot nematode and other pathogen in ginger cultivation

Methyl bromide (MBr) is listed as an ozone depleting substance in the Copenhagen Amendment (1992) to the Montreal Protocol. China ratified the Copenhagen Amendment in April 2003. The project of phasing out MBr in China's agriculture sector started in 2008. Ginger is one of the main crops using MBr as soil fumigant. Through three years of phasing-out activities, it has been found that there are big differences between different areas regarding the types of soil-borne diseases and pathogenicity. China is inviting international technical consulting services on root-knot nematode and other pathogen isolation, identification, assessment and control for ginger crop. *Contact: Foreign Economic Cooperation Office, Ministry of Environmental Protection, 5 Houyingfang Hutong, Xicheng District, Beijing 100035, China. Tel: +86 (10) 8226 8902; Fax: +86 (10) 8220 0522.* (Source: en.mepfeco.org.cn)

SRF Board approves second overseas plant

The Board of SRF Ltd., India, has approved expansion projects worth Rs. 6.65 billion (US$148.3 million), including one for setting up the company's second overseas packaging film plant and second HFC-134a plant. The packaging film plant would manufacture biaxially-oriented polypropylene (BOPP) film in South Africa and will have a capacity of 5,400 t/y. The plant with an investment of Rs 250 million (US$5.58 million) is set to start operations from July 2013. The HFC-134a plant with a capacity of 15,000 t/y will be located at SRF's Chemical Complex in Dahej, India. The capacity of this plant is three times that of the company's first HFC-134a plant. The project is expected to cost an estimated Rs 3.65 billion (US$81.4 million) and be operational by January 2013. (Source: www.thehindubusinessline.com)

HCFC phase-out management plan in Pakistan

At the launching of the Hydrochlorofluorocarbon (HCFC) Phase-out Management Plan (HPMP) in Pakistan, Environment Secretary Mr. Khawaja Muhammad Naeem stated that Pakistan is fully committed to its international obligations towards protecting the Earth and its fragile atmosphere. The successful implementation of the HPMP will ensure Pakistan's contribution towards saving the ozone layer. Mr. Naeem urged participating refrigeration industries to make the best use of opportunity to upgrade processes to protect the ozone layer.

Additional Secretary, Environment, Mr. Kamran Ali Qureshi said that there are numerous panels

of scientists and experts who are continuously working to find the replacements of the ozone depleting substances. He added that the member countries to the Montreal Protocol have to freeze their HCFC consumption in 2013 at the average of 2009-2010 and then gradually eliminate consumption in the 2015-2030 time-frame. The Ozone Cell's National Programme Manager Mr. Asif Khan, and representatives of United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP) and United Nations Industrial Development Organization (UNIDO), as well as some environmental experts also addressed the congregation. (Source: www.pid.gov.pk)

Taiwan finalizes preliminary HCFCs quotas for 2011

The Environment Protection Agency (EPA) of Taiwan province of China has finalized 2011's hydrochlorofluorocarbons (HCFCs) preliminary quota allocations for users and importers. The 2011 national cap for HCFCs is 159,539 ozone depletion potential (ODP) tonnes, which is 25 per cent of the consumption baseline of 638,156 ODP tonnes. The government reserves 10 per cent of annual cap belonging to the competent authority for national emergency, military or national construction purposes. As there were no recycling case applications until the end of October 2010, 5 per cent of annual cap has been preliminary released to importers in advance for the economic revival condition. However, the Taiwan EPA will keep encouraging the recycling of HCFCs and carefully review the actual market needs for next year. (Source: www.saveoursky.org.tw)

Good Practice in Handling CFCs and Servicing of Non-CFC Refrigeration Appliances

A training handout on "Good Practice in Handling CFCs and Servicing of Non-CFC Refrigeration Appliances" prepared by refrigeration and air-conditioning (RAC) experts is being used in the training programmes for RAC technicians. The manuals are aimed at imparting to technicians a better understanding of equipment during practical sessions.

For more information, access:

http://www.nccopp.info

REFRIGERATION/ AIR-CONDITIONING

Promising future for electric field refrigeration

In the United States, a team of researchers from Pennsylvania State University – led by Dr. Qiming Zhang and supported by the United States Department of Energy – are investigating electrically induced heat effects of some ferroelectric polymers for compressor-free refrigeration systems. The electric system is comparable to magnetic refrigeration but electricity is claimed to be more convenient. In these promising polymers, an applied voltage causes the molecules to align, thus creating greater order.

The electrocaloric materials consist of long molecular chains with a positive electric charge on one end and a negative one on the other, which can move around freely and are disorganized and oriented randomly in normal state. When electricity is applied, these molecules become highly ordered, and the material gives off heat to become cold. When the field is disengaged, the chains randomize and the polymers absorb heat. The researchers have reported a temperature change of 12°C at ambient temperature as low as 55°C – an improvement in terms of magnitude over other electrocaloric materials at that temperature range. Another interesting feature is that these flexible polymers can be used for cooling and heating, which opens up opportunities for their use in a wide variety of products. (Source: www.iifiir.org)

Natural refrigerant compressors

Hydrocarbon refrigerants are an environmentally friendly, non-toxic, non-ozone depleting substitute for chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs). Cubigel Compressors S.A., Spain, has developed a complete high-efficiency compressor range utilizing the natural refrigerants R600a and R290. These compressors are more efficient than equivalent models charged with other refrigerants; therefore, Cubigel Compressors' high-efficiency

range, in their most advanced version, can save up to 50 per cent energy when compared with the standard efficiency ranges of R404a or R134a. *Contact: Cubigel Compressors S.A., Antoni Forrellad, 2, 08192, Sant Quirze del Valles, Barcelona, Spain. Tel: +34 (93) 7106 008; Fax: +34 (93) 7122 864; E-mail: contact@cubigel.com; Website: www.cubigel.com.* (Source: www.ejarn.com)

Compressors use "green" hydrocarbon refrigerant

ComStar International Inc., the United States, and its China joint venture company Hangzhou Maidi Heating & Refrigerating Equipment Co. Ltd. will begin offering appliance and air-conditioning compressors that use the patented R441A, a blended hydrocarbon refrigerant approved by the United States Environment Protection Agency (EPA). The compressors are made in China under the brand name Silekan. ComStar is the exclusive United States manufacturer and distributor of R441A. Domestic refrigerator energy-draw tests using R441A have shown a 48 per cent decrease in power consumption compared with refrigerators running on R134a. R441A is an extremely energy-efficient refrigerant that operates on about 25 per cent of what a normal charge of R134a would be in an appliance or automotive cooling system and at 40 per cent of an R22-charged appliance. Similar energy savings were found by electrical power consumption tests in air-conditioners and other appliances. As an added benefit, R441A has zero global warming potential and no ozone depletion potential. (Source: www.prweb.com)

New range of inverter split air-conditioners

Blue Star, India, has launched Inverter Split air-conditioners (ACs) in 1 t, 1.5 t, and 2 t capacities. These smart and intelligent ACs provide comfortable cooling, use the latest environment-friendly refrigerant R410A, and feature inverter technology that allows the compressor to change its frequency according to the ambient load and deliver cooling as per the requirement. For instance, a 1.5 t Inverter AC can decrease its capacity to 1 t or increase its capacity to 1.75 t. This eliminates any temperature fluctuations and helps maintain a comfortable temperature in the room. Inverter Split ACs are reported to save up to 30 per cent more power compared with non-inverter type. Another interesting facility in these ACs is an advanced feature designed to offer maximum comfort to the user. A mini-sensor in the remote control senses the surrounding temperature and transmits the signal back to the indoor unit. The indoor unit then adjusts the temperature to ensure an appropriate temperature around the user – not the unit – thus optimizing user comfort. The Blue Star Inverter Split AC also comes with a special heat pump that is useful during severe winters. (Source: www.brandstoday.in)

Electronic air-conditioning

In Australia, Mr. David Sattler of Sattler Consulting was awarded a federal government grant to further his work on a new type of air-conditioner that allows for large cooling effects (and a heating potential) with minimal energy. A working prototype is expected to be ready by mid-2012. The technology used is based on a phenomenon called "sub-atomic thermal migration" – the thermal dissipation of a material is greatly enhanced when the media surrounding it is energized to an elevated potential state. The system itself is described as an electron generator, directing electrons from an electric plate to a dissipation heat exchanger. The electron exchange enhances the release of heat: the electron movement breaks down the thermal resistance of the boundary layer surrounding the heat exchanger, allowing for rapid and massive heat exchange. Heat can therefore be removed quickly and in great quantities, with minimal external energy and released into the ambient, acting as an "infinite" heat sink. A coefficient of performance (COP) of 40+ was achieved in the first trials. The technology could initially replace cooling towers and greatly increase the efficiency of existing air-cooled air-conditioners. (Source: www.iifiir.org)

Latest sustainable refrigeration innovations for retail business

Carrier Corporation, based in the United States, has introduced the latest innovations in carbon dioxide (CO_2) and hydrocarbon refrigerant solutions, some specifically designed to meet the challenging requirements of retail applications.

Carrier's breakthrough HybridCO2OL™ refrigeration system for stores operates in medium and high ambient temperatures and combines the best of CO_2 and hydrofluorocarbon (R134a) refrigerant technologies. The system is claimed to effect an annual reduction of greenhouse gas emissions of up to 31 per cent. The state-of-the-art, high-efficiency CO2OLheat™ heating system makes it possible to eliminate the need for additional fossil fuels in generating energy for heating by using waste heat from Carrier's CO2OLtec™ refrigeration system.

Carrier's new series of natural refrigerant Multinor island merchandisers and Presenter bottle coolers feature propane (R290), a low global warming and non-ozone depleting refrigerant that improves energy efficiency by 10 per cent versus models using standard refrigerants. The new Maress™ range of remote display cabinets are designed specifically for discount food retail formats. The Maress refrigerated cabinet can reduce energy consumption by up to 21 per cent in comparison with existing models of equivalent configuration. (Source: www.prnewswire.com)

Game-changing AE2 compressor

Tecumseh Products India Pvt. Ltd. has launched its AE2 next-generation compressor developed for the global commercial refrigeration market. While AE2 will support traditional hydrofluorocarbon refrigerants (R134a and R404A) it is also optimized for the hydrocarbon refrigerants R290 (propane) and R600a (isobutene). It is 25 per cent more efficient than its predecessor and offers "best-in-class" efficiency for compressors of its size – approaching an energy efficiency ratio (EER) of 10.7.

A smaller envelope size provides capacities that have been traditionally served by large compressors, crucial for compact applications. Compared with its predecessor, AE2 uses up to 25 per cent less oils for heat transfer, and has less vibration, thus reducing the potential for vibration-induced metal fatigue. AE2 is designed and developed to fulfil Tecumseh's Green Products Initiative. The company claims that its new compressor has been designed to satisfy even the most severe energy requirements of today as well as those of the future. (Source: www.fnbnews.com)

SOLVENTS

Paint and powder coating stripper with VOC-free formula

D-Zolve 917, a new VOC-free formulation from Solvent Kleene Inc., the United States, provides safe removal of organic paints, varnish, mil-spec chemical agent resistant coatings (CARCs), cured powder coatings, multi-layer coatings as well as E-coatings. Designed for energy efficient use at low temperatures, the non-inflammable D-Zolve 917 is used in an immersion tank. It has very low odour toxicity and does not contain any ozone depleting components or carcinogens. D-Zolve 917 penetrates paints and coatings to break the bond between the paint layer and the substrate. Severing this bond causes a paint or coating to delaminate and fall off the substrate and drop to the bottom of the tank.

D-Zolve 917 can completely remove even the most difficult to strip paints and coatings. It is ideal for reworking high-value parts with paint or coating defects, and will not damage intricate surface details or polished surfaces. The solvent provides safe stripping of paints and coatings from ferrous and non-ferrous metals including aluminium, copper, brass, stainless steels and carbon steels, besides plastic and silicon substrates. *Contact: Solvent Kleene Inc., 119 Foster Street, Building #6, Peabody, MA 01960, United States of America. Tel: +1 (978) 531 2279; Fax: +1 (978) 532 9304; E-mail: sales@solventkleene.com.* (Source: news.thomasnet.com)

Aerosol cleaning

Novec fluids from 3M, the United States, are excellent for removing fine particulates during hand wiping of critical components found throughout electronics manufacturing facilities. The solvents evaporate quickly and completely, leaving behind no residue. Because they are highly stable, non-reactive and non-inflammable, they can also be incorporated into aerosol spray cleaners where they act as both carrier solvents and cleaning agents. Novec aerosol cleaners are designed to meet the need for safe, sustainable and effective solvents in a convenient aerosol form. These

fast-drying materials offer a wide margin of user safety in maintenance, rework and repair operations. They are a sustainable alternatives to ozone depleting solvent cleaners such as HCFC-141b because they are non-ozone depleting and do not contain n-propyl bromide (nPB), hydrofluorocarbons (HFCs) or hazardous air pollutants (HAPs). *Contact: 3M, Corporate Headquarters, 3M Centre, St. Paul, Minnesota, MN 55144-1000, United States of America. Tel: +1 (888) 364 3577.* (Source: solutions.3m.com)

Fibre optic cleaner

Proprietary solutions based on Cirozane™ cleaning chemistry from ITW Chemtronics, based in the United States, are the first non-ozone depleting, non-inflammable fibre optic cleaner safe for use on plastics and fibre. Cirozane-based products offer a high performance, ultra-safe drop-in replacement to all chlorofluorocarbons (CFC) and hydrochlorofluorocarbon (HCFC) chemistries. Cirozane is based on 3M™ Novec™ engineered fluids. Cirozane-based products offer the performance of CFCs and HCFCs without any ozone depleting compounds. Potential application areas are handling soils from live circuits, cleaning oil and residue from sensitive surfaces, and cleaning connector end faces. *Contact: ITW Chemtronics, 8125 Cobb Centre Drive, Kennesaw, 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)

Cleaning solvents

Abzol® cleaners from Albemarle Corporation, the United States, are high-performance precision cleaning solvents for vapour degreasing, cold cleaning and ultrasonic cleaning, but with some very important differences from the chlorocarbons, hydrochlorocarbons and chlorofluorocarbons currently in use. They offer very low ozone depletion potential (ODP) and very low global warming potential (GWP). They have no flashpoint by either the tag closed cup or open cup methods.

The solvents are easy to recycle, compatible with metals and less likely to corrode than some other solvents. Abzol cleaners offer outstanding solvency and cleaning, excellent penetration into crevices, rapid drying, compatibility with most vapour degreasers, and very low acid formation. They can be distilled and recovered. (Source: www.albemarle.com)

Industrial cleaner/degreaser

Classic Chemical Corp., the United States, offers a powerful, non-hazardous, liquid concentrate degreaser. ALT industrial cleaner/degreaser is a free-rinsing industrial degreaser that effectively replaces ozone depleting chemicals such as trichloroethylene (TCE), perchloroethylene (PCE), corrosive caustic cleaners and solvent type degreasers. Based on a unique, non-toxic formula, the ALT cleaner/degreaser meets today's tougher environmental regulations and health and safety concerns. Extraneous oils, dirt and impurities are quickly removed from parts. It is safe to use on all types of ferrous and non-ferrous metals and allows for convenient, low-cost disposal. Common applications include spray-wash cabinets, heated dip tanks, ultrasonic systems and even hand wiping.

Through the use of surface active agents, ALT penetrates and loosens the bond of substrate oil by lowering surface and interfacial tension. Oil droplets are coated with a thin film of surfactant and are immiscibly sequestered to the surface of your cleaning solution and away from your part. Since ALT does not emulsify oil, the oils are dispersed within the solution, thereby enabling this product to be reused many times – as much as four times longer than caustic cleaners. The product prevents sludge build-up within the cleaning system, keeping the equipment free of lime and particle build-up on and around heating coils and spray nozzles. *Contact: Classic Chemical Corp., 26 Little Leaf, Batesville, IN 47006, United States of America. Tel: +1 (812) 934 3289; Fax: +1 (812) 934 2421.* (Source: www.degreaser.net)

Low-VOC/HAP-free solvent

The United States Naval Air Warfare Centre's Aircraft Division offers a new solvent cleaner. Navsolve has a low volatile organic compound (VOC) content and no hazardous air pollutants (HAPs). Navsolve incorporates the advantages of a solvent-based cleaner, while offering the low VOC/HAP free benefits of water-based or semi-

aqueous cleaners. Navsolve is an environment-friendly solvent used to clean grease and hydraulic fluids. Potential applications include degreasing/cleaning of mechanical parts and equipment in the automotive, aircraft, marine and dry-cleaning industries. *Contact: Office of Research & Technology Applications/Business & Partnership Office, Naval Air Warfare Centre Aircraft Division, United States of America. Tel: +1 (301) 342 1133; E-mail: NAWCAD.NBO@navy.mil.* (Source: wbt.flintbox.com)

"Green" solvents for precision cleaning applications

Dysol Inc., the United States, offers the DS-series solvents for precision cleaning needs. Developed to replace solvents that are ozone depleting or contain hazardous air pollutants, the company's low vapour pressure technology will safely provide equal or better cleaning performance while protecting the environment and employees. The DS-series solvents dry quickly without leaving any residue. The solvents are safe on all metals and composites. The products include the following:

- DS-104 solvent is a precision cleaning solvent especially good at removing hydrocarbon soils such as oils, greases and tars as well as common shop contaminants, epoxies and sealants;
- DS-108F solvent is a very effective cleaner on a wide range of soils including hydrocarbon soils, adhesives, epoxies, sealants, inks, dyes, etc.;
- DS-144 solvent is a high-flashpoint, precision cleaning solvent for removing oils, greases and tars, as well as common shop contaminants, epoxies and sealants;
- DS-800 solvent is a cost-effective degreasing solvent, especially good at removing hydrocarbon soils such as oils, greases, tars and cutting oils as well as common shop contaminants;
- DS-3101 solvent blend is an environmentally compliant solvent blend primarily used in cleaning metal surfaces prior to painting; and
- DS-801 paint spray gun cleaner is a low-cost, low-VOC solvent blend developed for cleaning paint spray guns and other painting equipment.

Contact: Dysol Inc., 2901, Shamrock Ave., Fort Worth, Texas 76107, United States of America. Tel: +1 (817) 3351 826; Fax: +1 (817) 3352 405; E-mail: info@dysol.com. (Source: www.dysol.com)

FOAMS

Improved polyurethane rigid foam system

BASF Polyurethanes, based in Germany, offers a new polyurethane rigid foam system with a fine, closed-cell structure for the insulation of freezers and refrigerators. This top-shelf solution provides unmatched thermal conductivity levels by incorporating vacuum insulated panels technology. Elastocool® technology has been developed to enhance processability, flow characteristics, and gel and demoulding time. The K-factor and density distribution are also improved, besides enhanced mechanical and physical properties of the final product.

The system has the ability to meet the energy requirements of thermal insulation applications that are extremely demanding. Customized solutions to suit various processing requirements – such as viscosity, fill and curing rates – are available. BASF offers Elastocool with more environmentally friendly blowing technologies, including hydrofluorocarbons (HFCs), combination of water with cyclopentane and its low boiling point isomers, partially halogenated hydrocarbons, and combinations of water with halogen-free and low-boiling point hydrocarbons. *Contact: BASF Polyurethanes, 42/F, Floor, Jardine House, No. 1 Connaught Place, Central, Hong Kong, China. Tel: +852 2731 0111; Fax: +852 2731 5636.* (Source: www.polyurethanes.asiapacific.basf.com)

Blowing agent enhancers for polyurethane foam production

Air Products and Chemicals Inc., the United States, has applied for a patent for its blowing agent enhancers for polyurethane (PU) foam production. The rigid PU blowing agent enhancers, methods for using them and the products produced by these methods are disclosed. The enhancers are low molecular weight alcohols and/or ethers that assist the action of blowing agents containing a hydrohalocarbon compound. In one aspect, the invention is a composition for producing a PU foam. The composition comprises a polyol, a polyisocyanate, a blowing agent (hydrohalocarbon)

and a blowing agent enhancer comprising at least one compound having a molecular weight less than about 500 g/mol and a molecular formula of $RO–(CH_2CHR"O)_n–R'$; wherein R is selected from the group consisting of a C_1-C_{10} aliphatic group, a C_5-C_{10} cycloaliphatic group, a C_7-C_{10} araliphatic group, a C_1-C_{10} aliphatic group comprising a nitrogen atom or oxygen atom, a C_5-C_{10} cycloaliphatic group comprising a nitrogen atom or oxygen atom, and a C_7-C_{10} araliphatic group comprising a nitrogen atom or oxygen atom; R' is selected from the group consisting of R, hydrogen, acetyl, propionyl and butyryl, provided that at least one compound has no more than one hydroxyl group per molecule; R" is hydrogen or a C_1-C_5 alkyl group; and n is an integer equal to or greater than 1. *Contact: Air Products and Chemicals Inc., 7201, Hamilton Boulevard, Allentown, PA 181951501, United States of America.* (Source: www.freepatentsonline.com)

Foams and foamable compositions with halogenated olefin blowing agents

Honeywell International Inc., the United States, reports an invention that provides foam-forming methods that comprise preparing a foamable system consisting of at least one hydrohaloolefin, and ensuring either the substantial absence of long-term decomposition-inducing contact between the hydrofluoroolefin and an amine-containing catalyst; or that an effective amount of surfactant is available in the system under conditions that prevent long-term exposure of the surfactant to a long-term decomposition reaction environment; or a combination of these two.

Related methods, foamable systems and foams are also reported. Preferred embodiments provide polyurethane and polyisocyanurate foams and methods for the preparation thereof, including closed-celled, polyurethane and polyisocyanurate foams and methods for their preparation. The preferred foams are characterized by a fine uniform cell structure and little or no foam collapse. The foams are preferably produced with a polyol premix composition comprising a combination of a hydrohaloolefin blowing agent, a polyol, a silicone surfactant, a catalyst and is further characterized by being substantially free of any added water. *Contact: Honeywell International Inc., No. 101, Columbia Road, Morristown, New Jersey 07962, United States of America.* (Source: www.wipo.int)

Microcellular foaming process

In the United States, a technology called MuCell™, developed at Massachussetts Institute of Technology (MIT), makes plastics super strong but extra light. The MuCell moulding technology uses low-cost, environmentally friendly supercritical fluids (SCFs) of carbon dioxide and nitrogen as physical blowing agents to produce a polymer melt of low viscosity. This low-viscosity melt is subsequently used by the moulder to reduce cycle times, improve dimensional stability, produce microcellular foam and reduce weight of most injection-moulded parts. The technology offers barriers to entry, offers lower plastics material melting viscosity (less energy and faster injections), generates savings in both materials and producing cycles, and does not need any changes to existing raw materials.

Initially developed as a method of producing relatively thin extruded sheet and tubes, the MuCell moulding technology now encompasses a broad range of patented moulding techniques that can reduce product costs, improve processability and increase the performance of moulding machines. The technology is licensed by Trexel Inc., a world leader in the development and commercialization of the MuCell moulding technology. The technology is available as a retrofit to installed injection moulding equipment and as an option on selected new injection moulding machines (only on licensed OEMs). All MuCell-capable machines – new and retrofitted – are also capable of conventional, non-foaming operation. The cost of Trexel MuCell microcellular plastics injection moulding technology conversion kits is from US$150,000 to US$ 300,000 per plastic injection moulding machine. (Source: tommytoy.typepad.com)

Mixing heads for PU foam

Rigid polyurethane (RPU) foam systems are processed on high-pressure metering machines that can be engineered to deliver varying throughput, to utilize pentane as blowing agent or to meter nitrogen (e.g. for purging refrigerator housings with nitrogen). KraussMaffei Technologies GmbH

from Germany offers MKE-3B and MK-UL mixing head ranges that can be used with all currently available RPU foam systems and guarantee a spatter-free, laminar pour. The mixing heads are suitable for manufacturing a very wide range of products. The list includes refrigerators, freezers, hot water boilers, chiller units, foam-filled profiles, sandwich elements with laminated decor surface layers and siding for cold storage warehouses. Particularly the mixing heads can be used with environmentally compatible blowing agents (such as pentane).

Customer benefits include outstanding thermal insulation from even thin layers of RPU foam, which can form very stable and self-adhesive composites with a wide variety of outer layers. The bulk density of RPU foam can be set within a wide range, while the excellent flow characteristics allow wide design freedom. *Contact: KraussMaffei Technologies GmbH, Krauss-Maffei-Strasse 2, 80997 München, Germany. Tel: +49 (89) 8899-0; Fax: +49 (89) 8899 2206.* (Source: www.krauss-maffei.de)

Foam extrusion with CO_2 gas

Nanjing Useon Extrusion Equipment Co. Ltd., China, offers technology to produce extruded polystyrene (XPS) foam using carbon dioxide (CO_2). XPS is commonly used for insulation boards. In the process polystyrene granules are fed into an extruder where they are melted, and critical additives are mixed in the viscous fluid that is formed. Then, the blowing agent CO_2 is injected to make the mixture foamable. Under carefully controlled heat and pressure conditions, the foamable mixture is forced through a die to produce XPS. The rigid foam is then trimmed to the final product dimensions. The COMER series production line produces XPS foam boards of 20-120 mm thickness (variable with formulation and blowing agent) and 600 mm/1,200 mm width (custom widths are possible). The maximum production capacity is 1,000 kg/h. The production line integrates the excellent mixing performance of twin-screw extruder and cooling performance of single-screw extruder. *Contact: Mr. Tree An, Nanjing Useon Extrusion Equipment Co. Ltd., No. 89, Dadingfang Industrial Park, Nanjing, Jiangsu, China. Tel: +86 (25) 5235 6058; Fax: +86 (25) 5235 2820; Website: www.useongroup.com.* (Source: www.yrccjc.com)

AEROSOLS

Innovative dispenser technology

Airolux AG, Switzerland, won a prestigious award for its innovative Air0Pack® dispenser technology "plastic instead of metal, air instead of propellant gas". The company won the silver award at the 2011 Edison Best New Product Awards™ event held in the United States. The developers substituted propellant gas with air in aerosols and made the entire dispenser in plastic instead of metal.

The innovative key component in the technology is a patented pressure control device (PCD). The Air0Pack dispenser is a plastic container fitted with a compressed air chamber. This employs the PCD to press a piston upwards, releasing the liquid content (gel or foam). This eliminates the disadvantages of conventional aerosol systems. Using plastic for the dispenser brings considerable advantages for the packaging design, lowers production costs and speeds up filling throughput times. Usage of air in place of aerosol propellant eliminates the risk of explosion and the need for metal containers. The technology has passed all tests and is ready for the market. *Contact: Airolux AG, Plant Switzerland, Industrie Ost, CH-8865 Bilten, Switzerland. Tel: +41 (55) 6192 700; Fax: +41 (55) 6192 799; Website: www.airolux.com.* (Source: www.prnewswire.com)

Budesonide suspensions for use in an HFA-pressurized MDI

Researchers in Thailand have studied the development of budesonide as a suspension-based pressurized-metered dose inhaler (pMDI) using hydrofluoroalkane propellants (HFA-134a, HFA-227 and HFA mixtures) and stabilizing agents (oleic acid and sorbitan trioleate). A factorial design method was applied to investigate the effects of two factors (vapour pressure of the propellant system and concentration of stabilizing agents) on formulation performances. Each factor was studied at three levels, and 24 formulations of budesonide suspension-based pMDI were prepared. The results indicated that vapour pressure of the propellant system was an important factor that affected the content of the active ingredient

($p < 0.05$). The formulations containing HFA-134a (high-level vapour pressure) gave drug contents above the maximum limit (>120 per cent), while the formulations containing HFA-227 (low-level vapour pressure) gave low budesonide contents of approximately 50 per cent. However, with a propellant mixture at intermediate vapour pressure, the budesonide contents were near the acceptable range (80-120 per cent).

Consequently, eight formulations containing the HFA mixture together with different types and concentrations of stabilizing agent were tested for their aerosol properties. The fine particle fraction measured by a twin-stage liquid impinger was in the range of 32-38 per cent. The mass median aerodynamic diameters obtained from the Andersen cascade impactor were approximately 3 µm for all formulations. No significant difference was found among the formulations. After three months of storage, the aerosol properties did not change. *Contact: Dr. Teerapol Srichanaa, Department of Pharmaceutical Technology, Prince of Songkla University, Hat Yai, Songkhla 90112, Thailand. E-mail: teerapol.s@psu.ac.th.* (Source: www.scienceasia.org)

Improved medicinal aerosol formulations

Jagotec AG, Switzerland, is patenting its invention that provides a medicinal aerosol suspension formulation for pressurized metered dose inhalers (pMDI) administration. The formulation consists of micronized pa-agonist, micronized corticosteroid, a moisture-scavenger excipient, and a hydrofluoroalkane (HFA) propellant. The first three and their respective relative amounts are selected such that they associate to form floccules having a density substantially the same as that of the HFA propellant.

Drugs for the treatment of respiratory diseases and disorders are frequently administered directly to the lungs via inhalation to increase the therapeutic index and reduce side effects of the drugs. Inhalation can be in the form of either dry powders or aerosol formulations inhaled by the patient either through the use of an inhalation device or as a spray. *Contact: Jagotec AG, Eptingerstrasse 61, CH-4132 Muttenz, Switzerland.* (Source: www.wipo.int)

FUMIGANTS

Reactive films to limit methyl bromide emissions from soil

As methyl bromide (MBr) is still widely used for agricultural fumigation under Critical Use Exemptions, strategies are required to limit MBr emissions. Researchers at the Agricultural Research Service (ARS) of the United States Department of Agriculture (USDA) have designed novel reactive films (RFs) and tested their efficacy in limiting loss of MBr from soil. A reactive layer, containing dry ammonium thiosulphate (ATS), was sandwiched between two layers of plastic film. The lower layer of high-density polyethylene film (HDPE) is permeable to MBr, and the upper HDPE layer is a virtually impermeable film (VIF). MBr diffusion through, and transformation by, the RFs were tested in a stainless-steel permeability cell.

The RFs substantially depleted MBr on activation with water to produce ATS solution. MBr half-life (t[1/2]) was around 9.0 h at 20°C in the presence of activated RF and was sensitive to temperature (t[1/2] 15.7 h and 2.9 h at 10°C and 40°C, respectively). When the upper film layer was VIF, less than 0.15 per cent of the added MBr diffused through the film, with the remainder being transformed within the reactive layer. These findings indicate that RFs have good potential to reduce MBr emissions from fumigated soils. *Contact: Agricultural Research Service, Salinity Laboratory, 450 West Big Springs Road, Riverside, CA 92507, United States of America.* (Source: ozone depletion.researchtoday.net)

Fumigation alternative studied

In the United States, a Washington State University (WSU) researcher is assessing a quarantine treatment that would have several advantages over methyl bromide (MBr) fumigation for exported apples and cherries. It could be less expensive and more environmentally friendly, and should enhance fruit quality. Dr. Shaojin Wang from the Department of Biological Systems Engineering is leading a research project looking at a low-pressure system that might in the future be used as a quarantine treatment for both conventional

and organic fruit. Previous research with a low-pressure system on other crops had suggested that it could be an effective, environment-friendly, non-chemical alternative to MBr fumigation. It may be possible to treat fruit in shipping containers during transit to overseas markets, reducing costs and saving space for fruit packers.

Low pressure is achieved by applying a vacuum to the treatment chamber, thereby reducing the pressures of the gases and lowering the oxygen concentration. In a very low oxygen atmosphere, any insects in the fruit will suffer cell damage or death. The low-pressure system that Dr. Wang is using for the project maintains an atmosphere with an oxygen level of 0.02-0.10 per cent (depending on temperature), no carbon dioxide, no ethylene and nearly 100 per cent relative humidity. These conditions, while killing the pest, help preserve fruit quality by inhibiting bacterial and fungal decay and preventing ripening and other causes of deterioration.

The scientists have already researched the effect of a low-pressure treatment on the codling moth and other quarantine pests, using a pressure level of 50 mmHg and a temperature of 25°C-30°C. In tests with codling moth, larvae were the most susceptible life stage, and eggs were the least susceptible. Future research will focus on whether the same effects on codling moth can be achieved with lower pressures and lower temperatures. Since the treatment must kill the most tolerant life stage, the scientists will also look at how different lengths of exposure affect eggs in order to identify the optimal treatment. (Source: www.goodfruit.com)

New technology for Indian meal moth management

Russell IPM, a United Kingdom-based company, has launched a biorational alternative to methyl bromide for the control of Indian Meal Moth in food processing and storage facilities. Dismate PE is based on the disruption of the communication between insects. The product is reported to be a breakthrough in the protection of food in factories processing cereals, biscuit and chocolate, has already received the Health, Safety and Environment (HSE) approval in the United Kingdom for such application.

Dismate PE, a product based on the release of a small quantity of a nature-identical insect pheromone, disrupts the communication between the male and female Indian meal moths, leading to failed mating and subsequent and gradual reduction in pest population. Dismate PE was launched after extensive tests and evaluation by leading cereal manufacturers in different countries to establish its long-term viability as a reliable alternative to methyl bromide. *Contact: Mr. Shakir Al-Zaidi, 68 Third Avenue, Deeside Industrial park, CH5 2LA, United Kingdom. Tel: +44 (1244) 281 333; Fax: +44 (1244) 281 878.* (Source: www.prlog.org)

Methyl bromide alternatives

United States Department of Agriculture (USDA) scientists trying to find a replacement for methyl bromide (MBr) are studying an alternative soil treatment that uses molasses as one of its ingredients. Researchers with USDA's Agricultural Research Service (ARS) are examining whether a cropping system that uses molasses to stimulate microbial activity could replace MBr. They also are studying recently developed fumigants.

ARS scientists Dr. Erin Rosskopf and Dr. Nancy Kokalis-Burelle and former ARS researcher Dr. David Butler raised bell peppers and eggplant at USDA's Horticultural Research Laboratory to test a mix of composted broiler litter, molasses and anaerobic soil disinfestation (ASD). In ASD, top soil is saturated with water and covered with a plastic tarp. Then, a carbon source (molasses) is added to stimulate microbial activity. The sun-drenched tarp "cooks" the weed seeds in the soil while the carbon and water increase microbial activity, creating conditions apt for pest control.

As part of the project, ARS scientists Dr. Greg McCollum and Dr. Joseph Albano evaluated fruit quality and soil and plant nutrients. They heated the soil via solarization and treated plots with different levels of the organic materials and different amounts of water. They planted peppers and eggplant, and found nematode populations were reduced when treated with molasses and poultry litter. Molasses and poultry litter controlled grass weeds just as well as MBr and that the solarized treatments heated the soil to levels that were at or just below levels that are lethal for many soil pathogens. (Source: www.ars.usda.gov)

RECENT PUBLICATIONS

The Scientific Assessment of Ozone Depletion 2010

This guidebook released by the Ozone Secretariat presents new and stronger evidence of the impact of stratospheric ozone changes on the Earth's surface climate, as well as of the effects of climate change on stratospheric ozone. The book includes projections of hydrofluorocarbon (HFC) growth in scenarios that assume no controls, suggesting that, by 2050, global warming potential (GWP)-weighted emissions from HFCs could be comparable to the GWP-weighted emissions of chlorofluorocarbons (CFCs) at their peak in 1988. Leakage from ozone depleting substance banks are highlighted as the largest source of current ozone depleting potential. It warns that delay in the capture and destruction of estimated CFC banks in the 2011-2015 time-frame is likely to reduce the possible ozone and climate benefits that could be achieved by about 30 per cent.

Contact: Earthprint Ltd., P.O. Box 119, Stevenage, Hertfordshire SG1 4TP, England, United Kingdom. Tel: +44 (1438) 748 111; Fax: +44 (1438) 748 844; E-mail: enquire@earthprint.com.

Stratospheric Ozone Depletion and Climate Change

In recent years, many new concepts have emerged in the field of stratospheric ozone depletion to create a need for a concise in-depth publication covering the ozone-climate issue. This monograph fills that void in the literature and provides detailed treatment of recent advances in the field of stratospheric ozone depletion. It puts particular emphasis on the coupling between changes in the ozone layer and atmospheric change caused by a changing climate.

Contact: Book Sales & Marketing, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge CB4 0WF, United Kingdom. Tel: +44 (1223) 432 360; Fax: +44 (1223) 426 017; E-mail: books@rsc.org.

TECH EVENTS

06-08 Jul
Gangwon-Do
Rep. of Korea

International Conference on Air-Conditioning & Refrigeration
Contact: Society of Air-conditioning and Refrigerating Engineers of Korea, SAREK, #902 Korea Science and Technology Centre (KSTC), 635-4, Yeoksam 1-dong, Gangnam-gu, Seoul
Republic of Korea.
Tel: +82 (2) 554 8571, 554 8572;
Fax: +82 (2) 552 3929;
Website: www.sarek.or.kr/eng.

07-09 Jul
Chennai
India

NCRAC-2011 – National Conference on Refrigeration and Air-Conditioning
Contact: Prof. M.P. Maiya, Chairman, NCRAC-2011, Indian Institute of Technology Madras, Chennai 600036, India.
Tel: +91 (44) 2257 4665, 2257 5720;
Fax: +91 (44) 2257 4652, 2257 0545;
E-mail: NCRAC2011@iitm.ac.in.

21-26 Aug
Prague
Czech Republic

23rd IIR International Congress of Refrigeration
Contact: Icaris Ltd., Conference Management Services, Malé nám. 1, 110 00 Praha 1, Czech Republic.
Fax: +420 (266) 312 113;
E-mail: icaris@icaris.cz;.

12-16 Oct
Bangkok
Thailand

BANGKOK RHVAC '2011
Contact: Thai Trade Fair, 22/77 Rachadapisek Road, Chatuchak, Bangkok 10900, Thailand.
Tel: +66 (2) 511 6020;
Fax: +66 (2) 511 6008;
E-mail: titfd@depthai.go.th.

31 Oct-02 Nov
San Diego
United States

2011 Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions
Contact: Methyl Bromide Alternatives Outreach, 6556 N. Dolores Avenue, Fresno, California CA 93711, United States of America.
Tel: +1 (559) 449 9035;
Fax: +1 (559) 449 9037.

09-11 Nov
HCM City
Viet Nam

REVAC VIETNAM 2011
AMB Events Sdn Bhd, Suite 1701, 17th Floor Plaza Permata, 6, Jalan Kampar, Off Jalan Tun Razak, South East Asia and the Pacific, 50400 Kuala Lumpur, Malaysia.
Tel: +60 (3) 4045 4993;
Fax: +60 (3) 4045 4989;
E-mail: mha@ambexpo.com.

PUBLICATIONS from APCTT

PERIODICALS

(Free access at www.techmonitor.net)

- ❑ Asia Pacific Tech Monitor (6 issues/year) — (e-version)
- ❑ VATIS Update (6 issues/year)
  - ❍ Biotechnology — (e-version)
  - ❍ Non-conventional Energy — (e-version)
  - ❍ Food Processing — (e-version)
  - ❍ Ozone Layer Protection # — (e-version)
  - ❍ Waste Management — (e-version)

BOOKS

	Indian Rupees* (India, Bhutan and Nepal)	US Dollars*
❑ Managing Innovation for the New Economy: Training Manual, 2002 Volume 1: How to Guide & Quick reference materials Volume 2: Articles & Lectures	1,000.00	50.00
❑ Regional Capacity-building for the Adoption of ISO-14000 and Transfer of Environmentally Sound Technology: Training Manual, 2000	600.00	30.00
❑ Small Rural Industries in the Asia Pacific Region: Enhancement of Competitiveness of Small Rural Industries in a Liberalized Economic Environment and the Impact of Poverty Alleviation, 2000	600.00	30.00
❑ Technology Transfer and Technological Capacity-building in Asia and the Pacific		
❍ Volume 1: Big Countries and Developed Economies, 1999	600.00	30.00
❍ Volume 2: ASEAN, NIEs, SAARC and the Islamic Republic of Iran, 1999	600.00	30.00
❍ Volume 3: Least Developed and Pacific Island Countries and Economies in Transition, 1999	600.00	30.00
❍ Volume 4: Emerging Issues in Regional Technological Capability-building and Technology Transfer, 1999	600.00	30.00
❑ Rural Industrialization as a Means of Poverty Alleviation: Report of the Regional Seminar on the Enhancement of Partnerships among Governmental, Non-governmental and Private Sector Entities for the Promotion of Rural Industrialization for Poverty Alleviation, 1999	600.00	30.00
❑ Institutional Development for Investment Promotion and Technology Transfer, 1999	500.00	25.00
❑ Ozone Depletion Substances Phase-out Technologies: Problems & Issues on Technology Transfer, Absorption and Generation, 1998	300.00	15.00
❑ Development and Utilization of S&T Indicators: Emerging Issues in Developing Countries of the ESCAP Region, 1998	300.00	15.00
❑ ODS Phase-out: A Guide for Industry, 1998	500.00	25.00
❑ Proceedings of the Consultative Meeting on Technology Management Education and Training for Developing Countries, 1997	800.00	40.00

Notes: Amount less than Rs 500 should be sent through a demand draft only. Otherwise, payment should be made by cheque/ demand draft/UNESCO coupon in favour of the Asian & Pacific Centre for Transfer of Technology, payable at New Delhi.

 # Print version supported by the Ozone Cell, Ministry of Environment & Forests, Government of India, for distribution to a select target group.

** Amount to be sent to APCTT with the order for covering costs and handling charges.*