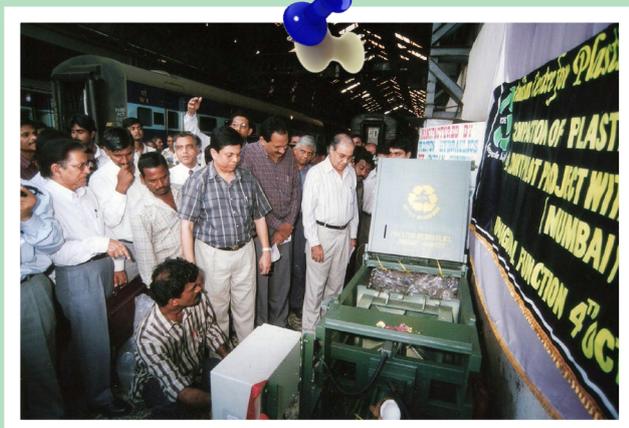


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Envis Eco-Echoes

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Area of Activity

**Capacity Enhancement Programme
on Management of Plastics, Polymer
Waste and Bio-Polymers, Impact of
Plastics on Eco-System**

Head of Institution

Mr. K. G. Ramanathan

President - GC



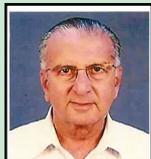
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Editorial



Recently it has come to our knowledge that some (less informed) people or group of people have accused PET (Polyethylene terephthalate), a type of plastics material widely used world wide especially for food, beverage and water packaging applications, for its alleged health hazard characteristics and also labelled an allegation that PET bottles are not recyclable and hence are eco-hazard. In this context, we also had come across email messages asking people not to use PET bottles for keeping drinking water in refrigerator, as this could result in leaching of hazardous chemicals. The scientific fact is that PET bottles are widely used for the packaging of drinking water, pharmaceuticals and beverages world wide as an approved safe packaging material.

Its safe use for direct contact with food products have been approved by statutory authorities like FDA world wide. Bureau of Indian Standards (BIS) listing the specifications for using various plastics materials including PET have been given in the Data Sheet of this edition of ENVIS Eco-Echoes Newsletter. The Lead Article covers some of the specific issues raised by some members of public. It is hoped that after going through this article, general public would be able to realise that PET bottles are absolutely safe for use as packaging material for drinking water, food and pharmaceutical products.

As a part of ICPE's continuous effort for creating awareness among the school students on Solid Waste Management in general and Plastics Waste Management in particular, several programmes were organised in Delhi as well as in Mumbai. Brief report on this has been covered in this issue of newsletter.

ICPE, jointly with Indian Institute of Petroleum and others, is Co-organising an important International Symposium on Feed Stock Recycling at Delhi during 23rd - 26th October, 2013 as per details given below. Interested readers may contact the organisers for more information and avail the opportunity to attend the same.

Organised by:

Council of Scientific and Industrial Research (CSIR)

CSIR-Indian Institute of Petroleum (IIP) Dehradun - India

Research Association for Feedstock Recycling of Plastics (FSRJ), Japan

Co-organised by:

Indian Centre for Plastics in the Environment (ICPE), Mumbai, India

Subscription Information:

ENVIS is sent free of cost to all those interested in the information on Plastics and Environment.

Readers are welcome to send their suggestions, contributions, articles, case studies, and new developments for publication in the Newsletter to the ICPE-ENVIS address.

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Editor

Mr. T. K. Bandopadhyay

PET – A Safe And Environment Friendly Material

PET (Polyethylene Terephthalate), is a type of plastics material, which is widely used world over especially for food, beverage and water packaging applications. PET is very useful plastic material, which has served the society at large in the modern world by its use in the diverse applications. The applications include - bottles and non-bottle applications like strapping, apparels, cushions, carpets etc. There are various applications of plastics in almost all fields of human activities like agriculture, medical, building, electrical & electronics, automobiles and households etc. Packaging is the single largest sector of application of plastics.

Plastics contribute various benefits to the modern world from providing safe and hygienic packaging materials for food and pharmaceutical products and drinking water, to conserving Land, Water, Forests and Energy resources to practically all areas of our life. Major advantages of plastics are:

- Chemically Inert allowing its use in direct contact with foodstuffs, pharmaceuticals and drinking water (all countries in the world formally approve such use)
- Energy Saving
- Least Emission to Air and Water
- Least Carbon Footprint on Earth
- Least consumption of fuel during transportation – due to light weight
- Unbreakable property – to list a few.

All commodity plastics are safe for using in contact with food items. In India, Bureau of Indian Standards (BIS), through its published documents declares the suitability of specific plastics materials for using in contact with food etc items. The Standard No. 12252:1987 (reaffirmed 2003) approves the use of PET material for its safe use in contact with Foodstuffs, Pharmaceuticals and Drinking Water. PET bottles play a very important role ensuring good health of the general public especially when they are on the move, by packaging safe drinking water in various sizes of bottles. Almost the entire liquid formulations of pharmaceutical products are packed in PET bottles today. Large range of beverages – both non-alcoholic and alcoholic, is packed in PET bottles for the various benefits provided as a packaging material.

For declaring a material environmentally friendly, one of the most important criteria is that the material should be recyclable. PET waste, like any other plastics waste, is 100% recyclable. In fact PET bottle waste is a much sought after material by the waste collectors as PET recyclers offer very good value for the collected PET waste bottles, which ranges from about Rs. 7 to as high as Rs. 20, per kg in major parts of India, depending on the condition and quality.

The consumption of PET bottles in India is estimated at about 6.0 lakh tons per annum, most of which is collected and are recycled mechanically in the organised sector. In the 90's, there was limited number of PET recyclers in India numbering 5 to 7. Today the number is more than 30.

Plastics in the trade of packaging of water

Different types of Plastics are used in the trade of packaged / mineral drinking water. Most used type is PET. Small quantities of some other types of plastics are also used in this application. PET as well as all other types of plastics which are used for this application is 100% recyclable. Currently India consumes 6.0 lakh Tonnes PET Bottle Grade Chips (for making bottles and other polyester packaging products).

Out of this, about 1.15 Lakh MTs are used for making packaging bottles for water, balance being used for manufacturing other types of bottles for the packaging of Carbonated Soft Drinks (CSD), beverages etc. Most of the PET bottles are recycled. As the demand for waste PET bottles are more, many recyclers import a good quantity of used PET bottles in to the country.

Consumption of PET for Packaging Water _ India

FY	PET for Water, Lakh Ton
2010	0.75
2011	0.83
2012	0.95
2013	1.15

Source: Industry

However the condition in the late 90's was different. Used PET bottles were strewn by the roadside and there were no organised collection mechanism and a waste management issue was created for the civic authorities. ICPE in 2001 had initiated a project at the Mumbai Central Railway Station for PET bottle collection and baling of the compacted waste bottles, to encourage recycling activity. Other stake holders also had put in their efforts. Within a period of about 3 years, an economic chain was established for the collection of PET bottle waste for supplying the same to the recycling industry.

Today, PET bottle waste is not found in the Municipality Solid Waste stream of any major cities of the country. These are collected by the waste pickers and are forwarded to the recyclers. The demand for the waste has gone up to such a level that some recyclers are even importing such waste from other countries to augment their requirement.

It has been observed that even in some remote places frequented by pilgrims/visitors, local waste pickers are engaged in collecting the PET bottle waste for sending to waste dealers in bigger towns and thus earn reasonable amount of money. At least some large recyclers have established a chain for the collection of PET bottle waste in different parts of the country.





PET products have least impact on environment during complete life cycle of 'Manufacturing to disposal' and there are many 'value-added products' made from recycled PET (RPET). This makes PET as one of the most 'Chemically Safe, Eco-friendly & Recyclable Polymer'. Recycling of PET is an environment friendly activity and is duly approved by the pollution control boards as per declared norms.

When the properties of PET are compared with alternative packaging materials, it is observed that there is minimum impact on the environment during entire life cycle of PET Bottles as compared to the alternatives.

- PET bottles are 63% more energy efficient than glass bottles and 47% more energy efficient than Aluminium (Al) cans during manufacturing.
- 100 kg of oil required to produce 1000 one-litre PET bottles as against 230 kg of oil for equivalent glass bottles.
- PET containers 35-50% more energy efficient than 'Glass bottles' during delivering (less weight).
- PET bottles enable a truck to carry 60% more soft drinks and 80% less packaging material resulting in 40% fuel saving and less air pollution.
- PET bottles enable one truck to carry 35 to 50% more pharmaceutical products as compared to glass bottles (100 / 200 ml size).
- An international carrier saves £6000 per year by carrying liquor in PET bottles instead of glass bottles.

- Glass bottles and Al cans generate 230% and 175% more atmospheric emissions respectively than PET bottles.
- Glass bottles and Al cans generate 2 times and 3 times more waterborne emissions respectively than PET bottles.
- PET bottles contribute 68% and 18% less solid waste by weight compared to glass bottles and Al cans respectively.
- Breakage issues
 - » Due to fragile nature, breakage occurs in Glass bottles during transportation and handling. These vary from 1.5% – 4.0 % depending on type and operation capability of user industry & type of 'filling line'. This also includes 'product losses' there by leading to 'opportunity cost'.
 - » Total losses will vary depending on 'pack size & product packed'.
 - » Typically Rs. 0.40 – 0.50 / bottle (say for a 650 ml glass beer bottle).
- Source (weight) reduction is possible, there by adding 'less material' to environment. It is an important element of 'Packaging Waste Disposal Regulations'.

Source:

Central Food Technological Research Institute (CFTRI), Mysore and published literature of different organizations working in related fields as posted in ICPE ENVIS Centre

Website: www.icpeenvnis.nic.in

ICPE At Chemtech World Expo, 2013

ICPE participated in the Exhibition Chemtech World expo, 2013 organised by Chemtech Foundation, which was held in Bombay Exhibition Center, Mumbai from 16th – 19th January, 2013. Open space was given to ICPE on which panels on plastics and the environment were displayed.

Awareness Films were screened and samples of recycled plastics products were demonstrated. ICPE's display panels had carried the issues on Plastics Waste Management and the solutions thereof, apart from describing the benefits of plastics. About 100 visitors visited the Stall.



Envis User Interaction Cum Evaluation Workshop From 18-19th Feb - 2013, Delhi

Envis National user interaction workshop, for Envis Centres organised by ENVIS Secretariat of MoEF, was held at India International Centre, Max Mueller Marg, New Delhi during February 18 – 19th, 2013.

Mr. Sudheer Khurana, Sr. Programme Officer of ICPE ENVIS Centre attended the Workshop.

In order to develop the databases on environment and its related parameters and to make it online to the Ministry for to and fro information flow.

A web enabled software, namely, Indian State Level Basic Environmental Information Database (ISBEID) was developed by ENVIS in collaboration with National Informatics Centre (NIC).



“Bengaluru: Wake Up Clean Up” Waste Expo

A 7 Day Event Initiating a Citywide Dialogue on Issues, Technologies and Solutions to handle our Waste Optimally was organised by Bruhat Bangalore Mahanagar Palike, (BBMP) at Freedom Park, Bangalore during 3rd -10th February, 2013. The event was inaugurated by the Honorable Chief Minister of Karnataka, Shri Jagadish Shettar. Urban Development Minister and top officials of the civic authorities were involved in organising the event. The State Government authorities had also invited top Industrialists of the State to participate and make commitment for the Clean Up activity in the Capital city.

Many companies manufacturing machineries for various waste management processes were invited to showcase their products. Composting Machines, Solar Energy Generating systems were on display.

RIL in co-ordination with ICPE & Karnataka State Plastic Associations took the opportunity to create an awareness on Plastic waste Management. Main objective of the participation was to create awareness among the general mass on the issues of Plastics Waste and how to address the same. ICPE had displayed various messages through Panels and also screened Awareness Films for the benefit of the public. Large number of school students visited the event and interacted with the exhibitors. Apart from Karnataka State Plastic Association, Karnataka Plastic Bags Association and Peenya Plastic Manufacturers Association also joined.

KSPA had organised for live demonstration of Plastic Waste Recycling using the Agglomeration machines. This unit attracted a lot of public, BBMP officials and others who could have snap shot of the recycling process.



Agglomeration Machine grinding the Plastic Waste



ICPE Member is addressing the School Children



The Karnataka Association representatives, appraising the Ministers



Biocon MD- Kiran Majumdar, being briefed by association member

Inauguration of The Plastics Waste Management Centre At The Sanjay Gandhi National Park

Due to its versatility, use of plastics is increasing in almost all fields of today's life across the world including India. Though plastics offer numerous benefits by providing safe and hygienic packaging materials for food and food products, conserves water, forests and energy resources, management of waste created by littered plastic items, especially the packaging materials which are discarded after single use, has posed a challenging task.

It attains a specific issue at Sanjay Gandhi National Park and the adjoining Canary Cave area, which are frequented by visitors everyday round the year. While spending their time inside the beautifully maintained forest ambiance in the Park, visitors also indulge in discarding empty packets of food items and water bottles haphazardly in the open area, causing a nuisance to the scenic beauty and also causing drainage problem of the natural

water falls flowing through the Park. While it is imperative that the general mass requires proper behavioral education on 'anti littering', at the same time the authorities also took initiatives to set up proper infrastructure to deal with the waste management issue with the assistance of ICPE and Plastindia Foundation.

As reported earlier, ICPE has donated a grinder machine to Sanjay Gandhi National Park for grinding of rigid plastics waste in small pieces so that it could be transported to the recyclers in smaller volume. A manual compacting device also was provided to the Park authorities for compacting flexible plastics waste. Park authorities created the space where a Grinding Machine was installed with the technical and financial assistance of ICPE.



Girl is sitting on a bench, made up of Plastic waste



People sitting on benches, made up of Plastic Waste



Shri A.K. Nigam, Addl. Principal, Chief Conservator of Forest (SGNP) inaugurating the Plastics Waste Management Centre



Machine operator grinding the PET bottles in the grinding machine

Awareness Programme at Miranda House, University of Delhi on 06th Feb. 2012

An awareness program was conducted on 06th February 2012 at Miranda House, North Campus, University of Delhi, Delhi. The programme was conducted by Dr. A.N. Bhat. Apart from Dr. Bhat, Shri Gopal Jha, Shri Mihir Banerji and Smt Geetha Murali also represented ICPE.

The college authority included the Vice President of MAH Vataran Society, Ms. Sreemoyi and Professors/teachers from the Department of Chemistry. Around 50 students from B.Sc. Chemistry Hon's and B.Sc. Life Science participated in the programme. Dr. A.N Bhat gave a brief introduction of ICPE and its Mission, viz to help sustain environment friendly image of plastics followed by ICPE presentation on "Plastic & Environment".

The presentation was received well, and their misconceptions about plastics were cleared by the presentation. ICPE awareness film "Listen Plastic Have Something to Say" in English was also shown during the programme. The programme was wound-up with a question/answer session.

The students showed lot of interest in Recycling, Reuse, waste management /segregation and proper disposal of waste. ICPE's booklets, Point-counterpoint & Frequently Asked Questions was distributed to all students and the recent editions of Eco Echoes/ENVIS Newsletter (10 copies) were handed over to the College library. It was felt ICPE Book on 'Life Cycle Analysis' would be very useful to the students, if a copy can be issued to their library.



Awareness Programme at J.B. Khot School, Borivali, Mumbai on 22nd March,, 2013

ICPE Mumbai office had organised a School Awareness programme at J. B. Khot School, Borivali, Mumbai on 22nd March, 2013. About 200 students of Class VIII and Class IX attended the programme. Six teachers also were present.

Shri Tushar Bandopadhyay of ICPE conducted the sessions with the assistance of Shri Sudheer Khurana and Smt Payal Das. The programme included screening of awareness films and deliberations through Power Point Presentation. Students interacted during the presentation on how they could contribute in the waste management and clean-up activities.

At the end of the programme a Quiz Programme was organised among the students and 10 prizes were declared for the successful students. The prizes were handed over to the Principal of the school Smt Krishnambal Suresh Babu for distribution.

The Principal of the school expressed her gratitude to ICPE Management for deputing its officers for organising the awareness programme for the students on the very important social issue. She expected that ICPE would offer its assistance in conducting such programme in the future also.



Seminar on Waste Recycling at SNTD University Juhu, Mumbai on 30th March, 2013

A Seminar was organised by ICPE and National Solid Waste Association of India (NSWAI) on Waste Recycling at SNTD Women's University, Juhu, Mumbai on the 30th March 2013.

About 200 Post Graduate students of the University, Teachers of the Environment Management Department of the University, officials of Pollution Control Board of Maharashtra, Members of NSWAI attended.

Dr Amiya Kumar Sahu, President – NSWAI talked about management of Municipal Solid Waste. Dr. Garg, eminent expert of Industrial Environment Management talked about Chemical Waste Management.

Shri Tushar K Bandopadhyay of ICPE made a presentation on Plastics Waste Management highlighting the various issues and solutions. Awareness Film of ICPE was screened during the seminar.



DATA SHEET

INDIAN STANDARDS FOR FOOD CONTACT AND SAFETY

IS: 9833-1981: List of pigments and colourants for use of plastics in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 9845-1998: Method of analysis for the determination of specific and/or overall migration of constituents of plastics materials and articles intended to come into contact with food stuffs.

IS: 10141-1982: Positive list of constituents of polyethylene for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 10142-1982: Specification for styrene polymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 10146-1982: Polyethylene for its safe use in contact with foodstuffs and drinking water.

IS: 10148-1982: Positive list of constituents of polyvinyl chloride and its copolymers for safe contact with foodstuffs, pharmaceuticals and drinking water.

IS: 10149-1982: Positive list of constituents of styrene polymers in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 10151-1982: Poly vinyl chloride (PVC) and its co-polymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 10910-1984: Positive list of constituents of Polypropylene and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 11434-1985: Ionomer resins for its safe use in contact with foodstuff, pharmaceuticals and drinking water.

IS: 11435-1985: Positive list of constituents of ionomer resins in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 11704-1986: Ethylene acrylic acid (EAA) copolymers for their safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 11705-1986: Positive list of Ethylene acrylic acid (EAA) copolymers in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 12229-1987: Positive list of constituents of polyalkylene terephthalates (PET & PBT) for their safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 12247-1988: Nylon-6 polymer for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 12248-1988: Positive list of constituents of Nylon-6 polymer for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 12252-1987: Polyalkylene terephthalates (PET & PBT) for their safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 13449-1992: Positive list of constituents of ethylene vinyl acetate (EVA) copolymers in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 13576-1992: EMA for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 13601-1993: Ethylene vinyl acetate (EVA) co-polymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

IS: 14972-2001: Positive list of constituents of polycarbonate in contact with foodstuffs, pharmaceuticals and drinking water.

The above standards cover requirements of basic resin, additives, monomers, pigments and colourants, overall migration and storage and control.

ALL THE STANDARDS PUBLISHED BEFORE 1998, HAVE BEEN REAFFIRMED IN 2003

ISSUED IN PUBLIC INTEREST BY INDIAN CENTRE FOR PLASTICS IN THE ENVIRONMENT

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