INDIAN RESINS MANUFACTURERS` ASSOCIATION

eNewsLetter
Edition: January 2024

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INDIAN RESINS MANUFACTURERS` ASSOCIATION

From The Editor's Desk

Dear Friends,

Wish you all a very Happy, Healthy & Prosperous New Year 2024 !

I am glad to inform you that this is the fifth edition of Irma e-Newsletter published under my editorship which will be of interest to you.

We are glad to share with you that IRMA AGM held on 29th September 2023 after the grand success of Irma Seminar on "Green Initiatives for Resin Industry" in the month of July 2023. On this occasion we had invited the guest speaker, Mr. Sapan Kumar Bardhan, Tansformational Coach for Self & Organisation Development)OD) to talk on the subject "Purpose of Life". It was well received by the members.

The present economic scenario is encouraging for the industry. We hope the industrial growth will increase and profitable.

With all of your support and contribution I will make every effort to bring the magazine regularly with good and useful reading material. You are most welcome to give your suggestions to further upgrade IRMA e-Newsletter. We also request you all to give us articles on technical, commercial or any other subject of educate value to our members.

HAPPY READING !

N. Kannan
Chief Editor

From The President's Desk

Dear Member,

Wish you all a very Happy, Healthy & Prosperous New Year 2024 !

This is my first communication to you after taking over as President of IRMA. I take this opportunity to thank each one of you for electing me and honoring me as your youngest President of IRMA till date.

I am humbled by the trust you (members) have placed in me, and I am excited to take on this role and work alongside each and every one of you to build upon the incredible work of my predecessors. Their efforts have helped to shape this organization into the thriving community it is today, and I look forward to continuing this legacy of excellence.

IRMA has always been a collective collaboration between the team. This culture of IRMA has been created by its founders and my predecessors have taken decisions collectively and for benefit of all. There is one good thing about IRMA that all past and present committee members work together leaving aside any ego or age bar, for the welfare of the association, we have our past presidents help for any kind of guidance and help, I expect full cooperation from them as always.

It is our earnest effort to introduce and induct more young members into IRMA managing Committee to take IRMA to greater heights. We are delighted to inform you of the newly elected Management Committee following the Annual General Meeting held on 29th September 2023. Our commitment to the development of our members remains unwavering. The newly elected committee is poised to safeguard your interests, foster effective government liaisons, stay abreast of geopolitical changes, provide insights into resin market dynamics, and organize knowledge-sharing and technical workshops, Seminars.

IRMA stands as a united front, dedicated to the growth and prosperity of each member. Looking forward to your active participation and involvement. The committee, dedicated to steering the Indian Resin Manufacturers Association (IRMA) towards greater heights, comprises the following members:

Myself - Mr. Hiren J. Shah: President IRMA. representing M/s Beeta Paint Industries.

Mr. Aditya Chandrachud from Boro Criss: The Vice President. Dedicated person, most of us are aware of his capabilities in organizing association events. One of my go to person for any work.

Dr. B Venkatraman: The Hon Secretary, President of Grasim Ind Ltd of Aditya Birla Group. He has vast experience in the industry, highly capable and we all have witnessed his recent action in IRMA seminar as a Coordinator and conductor of Panel Discussion which was appreciated by all.

Mr. Bhagyesh Narkhede from Mack Coatings.: Treasurer. Finally someone younger to me in the Committee. He very actively participated in the recent seminar for getting members and helped me in getting the souvenir perfect.
Mr. S Mahadevan- Immediate Past President. I want to express my appreciation to the outgoing President Mr. S. Mahadevan for his dedication and unwavering commitment to Indian Resin Manufacturers' Association. His leadership has made IRMA perform beyond expectations. On behalf of the entire association, I would like to extend my heartfelt gratitude for his exemplary service and leadership during his tenure as our President. His legacy of excellence will continue to inspire us. We wish him all the best in his future endeavors, and we look forward to continuing to build upon the foundation he has laid. Thank you once again for your exceptional service and leadership, and congratulations on a successful and fulfilling term as a President.

Mr. Vikrant Bajaria from Provik Industries.: He has been in Committee since past 4 years and we welcome him again to actively participate and work hands on with our other committee members.

Mr. Gaurav Sathe from DSV Chemicals Ltd.: Young and energetic new member entering committee for working hand in hand with us. He has experience of various other organisations as well which will be helpful for us.

Special Invitees to the managing Committee :

Dr. Parag Raut- Associate Member, Asst. V.President of H G Chemical Pvt. Ltd. Helping us in the committee since more than 8 yrs. A versatile technocrat to manage technical workshops, etc.

Mr. Ashay Mehta from Amber Chemicals - Associate member. We all are aware of his helping nature and ready to do any kind of work for the association, prepared many a Templets to wish IRMA members on various occasions.
Mr. Mahendra Chavan from Chemtex Speciality India Pvt Ltd.- Associate Member, He is a new entrant to IRMA Committee, will be of great help to us knowing his helping nature and his presence in other Similar associations as committee member.

Looking at the above committee members you can see that there is a surge in young members who are coming in, to be a part of Committee. The Participation of youth will help in revitalizing the organization. I am sure many new ideas will be introduced which are bound to help the members to keep up with the ongoing trends and technological advancements, besides uplifting their whole environment with their modern perspectives.

Hiren Jitendra Shah
President

Bio-based Epoxy Resins and Reactive Diluents

Ms. Thipa Naiyawat, Dr. Bharat Singh, Mr. Amit Dixit
Aditya Birla Chemicals Ltd. (Advanced Materials)
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Introduction

IN recent decades, bio-based polymers derived from renewable resources have become increasingly important as sustainable and eco-efficient products which can replace both thermoplastics and thermosets based on petrochemical-derived stocks. Bio-based products are wholly or partly derived from materials of biological origin, excluding materials embedded in geological formations and/or fossilized. In industrial processes, enzymes are used in the production of chemical building blocks, detergents, pulp and paper, textiles, etc. By using fermentation and bio-catalysis instead of traditional chemical synthesis, higher process efficiency can be obtained, resulting in a decrease in energy and water consumption, and a reduction of toxic waste. As they are derived from renewable raw materials such as plants, bio-based products help reduce carbon dioxide emissions and offer other advantages such as lower toxicity and novel product characteristics.

Bio-based chemicals are classified into three types: drop-in, smart drop-in and novel chemicals (Figure 1). Drop-in chemicals are bio-based versions of existing petrochemicals which have established markets. They are chemically identical to existing fossil-based chemicals. Smart drop-in chemicals are a special sub-group of drop-in chemicals that are chemically identical to chemicals based on fossil hydrocarbons, but their bio-based pathways provide advantages compared to the conventional pathways. Novel bio-based chemicals are chemicals which are produced via a dedicated pathway and do not have an identical fossil-based counterpart.

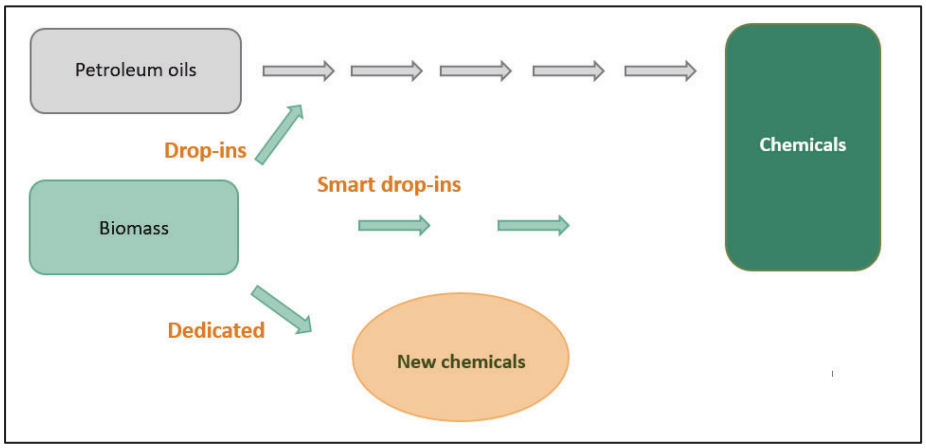

Figure 1: Pathways to different types of bio-based chemicals

Epichlorohydrin (ECH), an important feedstock for making epoxy resins is traditionally produced from propylene. An alternative process starts from glycerol, a readily available chemical from biodiesel production, produced through saponification of triglycerides from plants and animal sources. This ECH is commonly referred as bio-based or green Epichlorohydrin. The bio-carbon content of Epichlorohydrin derived from glycerol is 100%.

This paper illustrates bio-based drop-in epoxy resins and reactive diluents synthesized by using bio-based epichlorohydrin or green ECH.

Bio-based Epoxy resins and Reactive diluents

Conventional epoxy resins based on Bisphenol A, Bisphenol F and phenol novolac resin can be made by using green ECH (Figure 2). The physicochemical properties of these resins are comparable to resins made from petroleum-based ECH. These resins are partly bio-based having bio-carbon content, 28-31% (Figure 3 and 4).

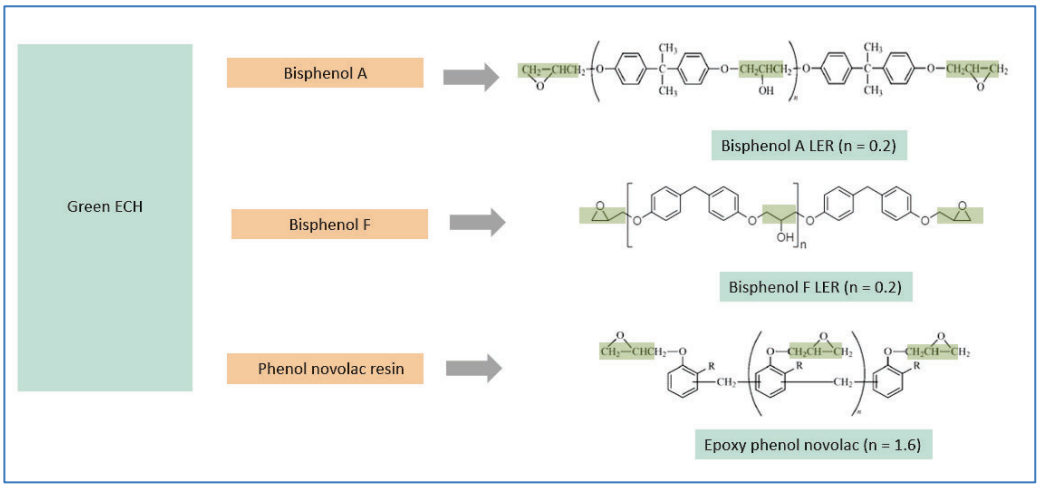

Figure 2: Partly bio-based epoxy resins

Properties	Bisphenol A LER		Bisphenol F LER		Epoxy phenol novoalc (f 3.6)	
	Typical range	Results	Typical range	Results	Typical range	Results
Appearance	Viscous liquid	Viscous liquid	Liquid	Liquid	Semi-solid	Semi-solid
EEW (g/q)	185 - 194	186.7	165 - 175	169.7	175 - 182	179.2
Viscosity at 25°C (mPa.s)	11,000 - 14,000	12,300	3,000 - 5,000	4,130	20,000 - 50,000 (at 52°C)	35,760
Color (Gardner)	0.5 max	0.2	1 max	0.3	1 max	0.5

Figure 3: Properties of partly bio-based epoxy resins

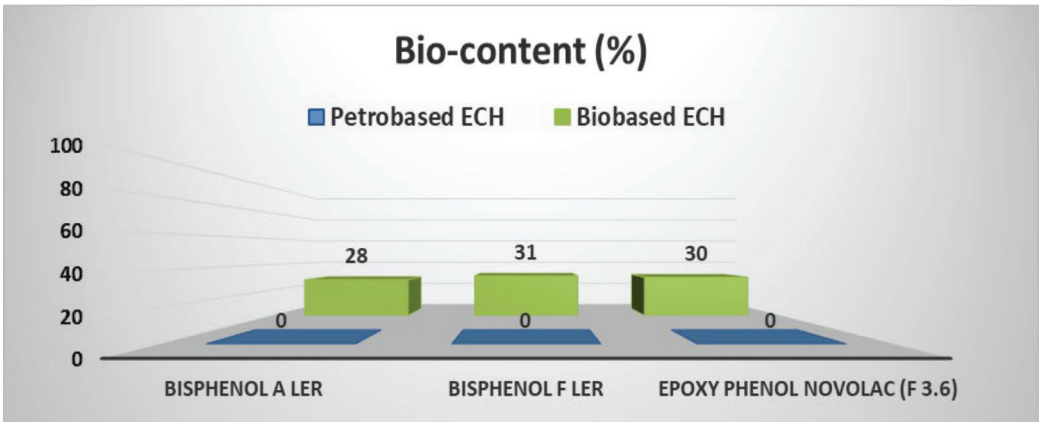

Figure 4: Bio-contents of partly bio-based epoxy resins

Similarly, partly bio-based epoxy reactive diluents can be made from o-cresol, 1,4-butanediol and 1,6-hexanediol using green ECH. These resins show comparable physicochemical properties compared to diluents derived from petroleum-based ECH (Figure 5 and 6). Bio-based carbon contents of these partly bio-based reactive diluents increase to 62% if di-functional alcohol is used (Figure 7).

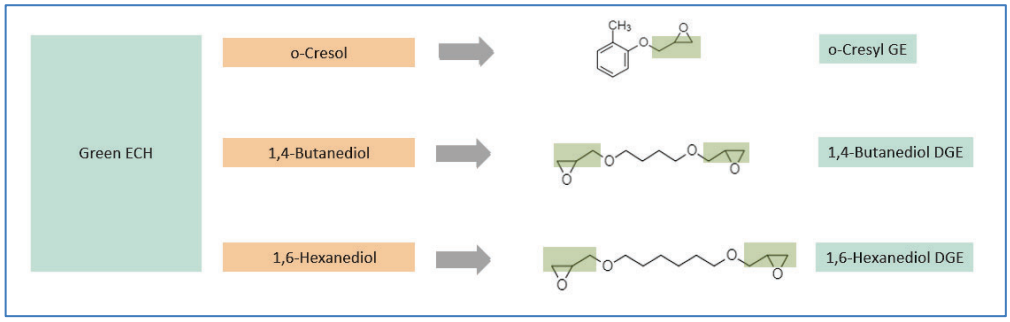

Figure 5: Partly bio-based reactive diluents

Properties	o-Cresyl GE		1,6-Hexanediol DGE		1,4-Butanediol DGE	
	Typical range	Results	Typical range	Results	Typical range	Results
Appearance	Clear liquid	Clear liquid	Clear liquid	Clear liquid	Clear liquid	Clear liquid
EEW (g/q)	175 - 190	179.2	140 -155	144.3	130 - 145	132.1
Viscosity at 25°C (mPa.s)	5 - 10	7.7	15 - 25	17.6	12 - 22	15.7
Color (Gardner)	0.5 max	0.2	0.5 max	0.1	0.5 max	0.1

Figure 6: Properties of partly bio-based reactive diluents

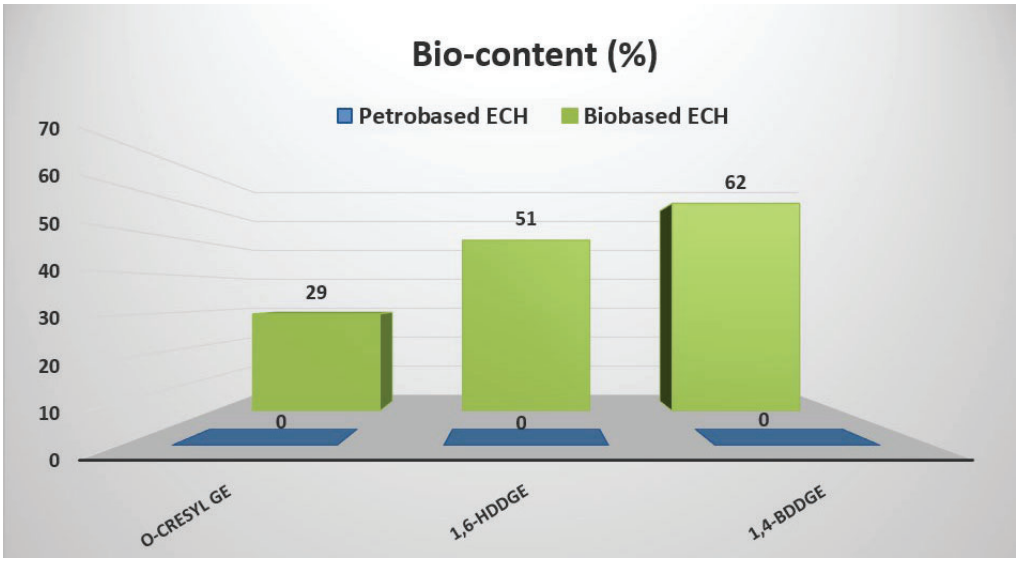

Figure 7: Bio-contents of partly bio-based reactive diluents

Wholly bio-based reactive diluents can be derived from alcohols based on plant oils and green ECH with similar physicochemical properties as diluents from petro-based ECH (Figure 8, 9). Importantly the bio-based carbon contents of these resins are 100% (Figure 10).

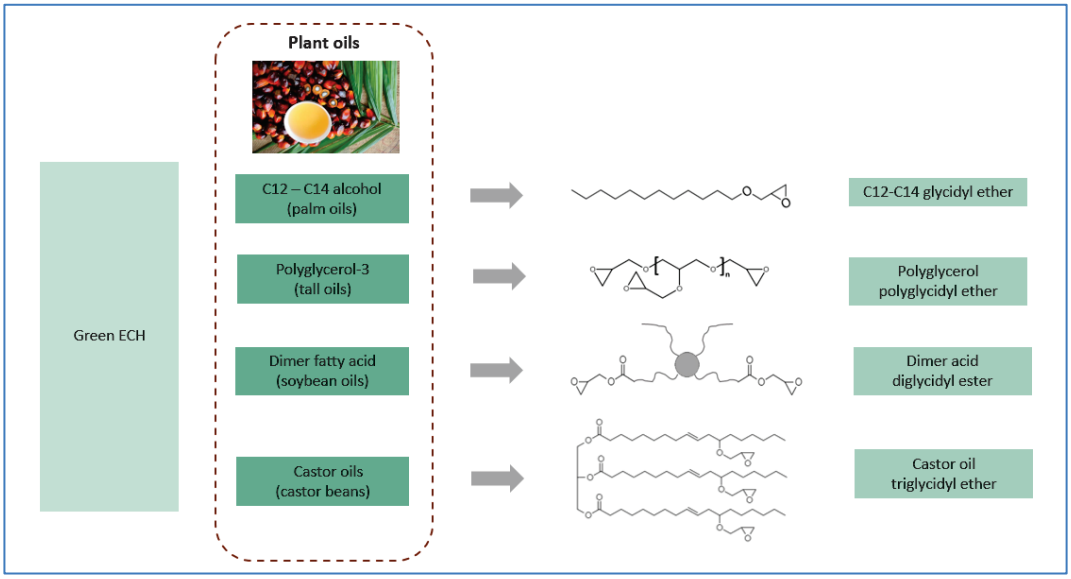

Figure 8: Wholly bio-based reactive diluents derived from plant oils

Properties	C12-C14 GE		Polyglyceol-3 PGE		Dimer acid DGE		Castor oil TGE	
	Typical range	Results	Typical range	Results	Typical range	Results	Typical range	Results
Appearance	Clear liquid	Clear liquid	Light yellow liquid	Light yellow liquid	Yellow liquid	Yellow liquid	Yellow liquid	Yellow liquid
EEW (g/q)	275 - 300	282.5	160 - 180	168.2	390 - 470	440.2	500 - 650	558.2
Viscosity at 25°C (mPa.s)	5 - 10	6.8	1,000 - 1,360	1,278	400 - 900	554	250 -500	338
Color (Gardner)	0.5 max	0.1	1 max	0.6	10 max	8	8 max	4

Figure 9: Properties of wholly bio-based reactive diluents derived from plant oils

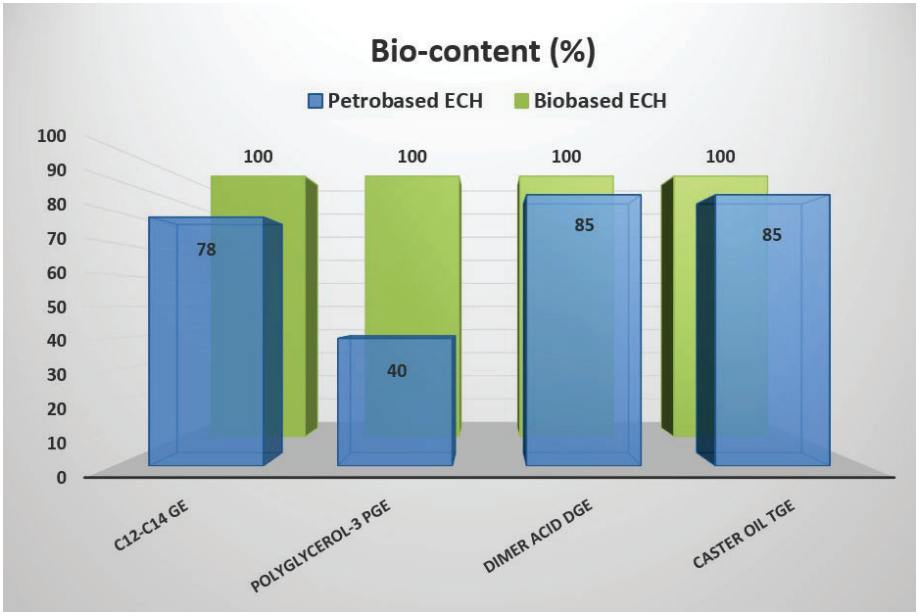

Figure 10: Bio-contents of wholly bio-based reactive diluents derived from plant oils

Apart from alcohols from plant oils, bio-alcohols from glucose example sorbitol and isosorbide. After epoxidation (Figure 11), sorbitol polyglycidyl ether had similar viscosity to standard Bisphenol A liquid epoxy resin whereas isosorbide diglycidyl ether exhibited low viscosity. Importantly the bio-carbon contents of these resins were 100% (Figure 12,13).

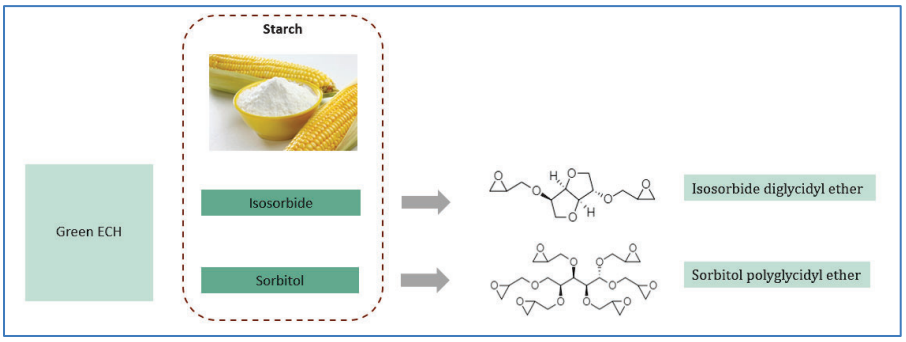

Figure 11: Wholly bio-based epoxy resins derived from glucose.

Properties	Sorbitol PGE		Isosorbide DGE	
	Typical range	Results	Typical range	Results
Appearance	-	Viscous liquid	-	Liquid
EEW (g/q)	-	169.5	-	150.1
Viscosity at 25°C (mPa.s)	-	11,734	-	970
Color (Gardner)	-	2	-	3

Figure 12: Properties of wholly bio-based epoxy resins derived from glucose.

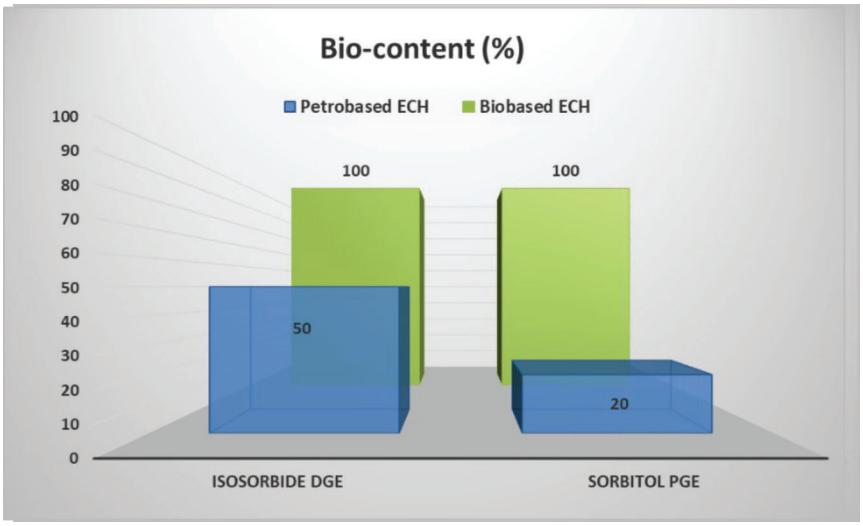

Figure 13: Bio-based contents of wholly bio-based reactive diluents derived from glucose.

Conclusion

The drop-in bio-based epoxy resins and reactive diluents provide an immediate pathway to enhance reduction of carbon dioxide emissions. These resins possess bio-carbon content from 28-100 % and their properties are comparable to epoxy resins made from petrochemical based feedstock's.

EVENTS

IRMA AGM held in Mumbai

THE Annual General Meeting of Indian Resin Manufacturers Association(IRMA) was held at Chembur Gymkhana, Mumbai on 29 September. More than 60 Members graced the occasion.


Hiren Shah


S. Mahadevan

Mr. S. Mahadevan, President, IRMA welcoming the attendees and members, said that the last two years had been a mixed bag, firstly dominated by the Omicron blues which did not allow any 'in person' activity and later, post covid, the rush of events post opening. India has shown resilience and growth momentum is continuous and thus the future is bright for the industry, he said. He took the audience through the events that was conducted both online and in-person in the past two years. He also congratulated the newly appointed young team of Committee members and promised all help and cooperation to them.


Sapan Kumar

The feature speaker of the day was Mr. Sapan Kumar who gave a talk on the "Purpose of Life". Mr. Sapan Kumar is a transformational coach for self & Organization Development (OD). His lecture was practical and showed clear path for success in professional & personal life. The spiritual & divine touch that he had given was very thought provoking

Inaugural session in progress

Book Release

and inspiring for peace of mind. The lecture was well appreciated by all the attendees.


The IRMA team

The incoming president Mr. Hiren Shah, giving the vote of thanks said: "I want to take this opportunity to express my appreciation to the outgoing president Mr. S. Mahadevan for his dedication and unwavering commitment to the Association and IRMA has performed beyond expectations in his


View of the audience

tenure. As we move forward, we want to assure you that we are fully committed to advancing our mission and ensuring that this association remains a valuable resource for our members. We plan to work collaboratively to identify new opportunities for growth, develop innovative programs, and build stronger relationships with our members in the coating Industry, along with activities like Workshops, Bi-Annual Seminar, Member engagement, government representations for helping members at large, training operator/supervisors".

The meeting ended with a networking cocktails and dinner.

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Indian Resins
Manufacturers'
Association
Annual General
Meeting


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Manufacturers'
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REGISTRATION


Indian Resins
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INDIAN RESINS MANUFACTURERS' ASSOCIATION















RAW MATERIAL SCENARIO

- Compiled by Hiren Shah

Rates are per KG for bulk buying. Rates prevailing as on 1/1/2024

Phthalic	-	98₹
Pentaerythritol	-	120₹
Glycerine	-	55₹
Benzoic acid	-	105₹
Maleic anhydride	-	95₹
Gum Rosin	-	93₹
Sorbitol (70%)	-	42₹
Fatty acids (130IV)	-	90₹
Mix xylene	-	82₹
Soya oil	-	90₹
Linseed oil	-	90₹
Castor oil	-	125₹
Slop oil reliance	-	70₹

A woman awakes during the night to find that her husband was not in bed. She goes downstairs to look for him. She finds him sitting at the kitchen table with a cup of coffee in front of him. He appears to be in deep thought, just staring at the wall.

She watches as he wipes a tear from his eye and takes a sip of his coffee.

"What's the matter, dear?" she whispers as she steps into the room. "Why are you down here at this time of night?"

The husband looks up from his coffee, "Do you remember 20 years ago when we were dating, and you were only 18?" he asks solemnly. "Yes I do" she replies.

The husband pauses; the words were not coming easily. "Do you remember when your father caught us in the garden?"

"Yes! I remember" said the wife, lowering herself into a chair beside him.

Once all the engineering professors were sitting in one plane.
Before the takeoff, one announcement came
"This plane is made by your students"
Then all professors stood up, ran and went outside.
But the principal was sitting.
One guy came and asked, "are you not afraid"?
Then the principal replied
"I trust my students very well and I am sure the plane won't even start".

THE BIGGEST LIE
Two boys were arguing when the teacher entered the room.
The teacher says, "Why are you arguing?"
One boy answers, "We found a ten dollar bill and decided to give it to whoever tells the biggest lie."
"You should be ashamed of yourselves," Said the teacher, "When I was your age I didn't even know what a lie was."
The boys gave the ten dollars to the teacher.

They say milk gives strength.
I drank 4 cups and couldn't move a wall.
But when I took 4 bottles of beers,
I saw the wall moving itself.
These scientists should better stop their lies.