Quest Journals
Journal of Research in Environmental and Earth Sciences
Volume 1 ~ Issue 4 (2014) pp: 27-29
ISSN(Online) :2348-2532
www.questjournals.org

Research Paper

Climate Friendly Bioresins

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ABSTRACT
The advancement of earth improved bioresin based cements is an appealing choice and the exploration need to convey the advances required. Bioresins would now be able to be utilized as regular, economical options in contrast to conventional engineered materials, for example, phenol-formaldehyde and isocyanate gums in the assembling of composite items. Bioresins, which can biodegrade or be reused are being utilized in car segments (vehicle and truck parts), foundation (scaffolds and parkway segments) and the development business (without formaldehyde wood based boards, designed wood items). Significant expenses are a critical obstruction to the advancement of bioresins, notwithstanding, creation is getting feasible as innovations advance, and economies of scale please stream, alongside cost swelling of oil and expanding mindfulness identifying with end of life removal are probably going to give developing occasion to bioresins.

KEYWORDS: *Organic, agro, waste, alternative, bioresin,* ***Climate****, polymer*

I. INTRODUCTION

Human beings have used resins since prehistory that has been evolved millions of years ago to defend plants against their enemies, as recorded by fossil resins like amber. The word *resin* comes from French *resine*, from Latin *resina*. Few people are aware of the great diversity of resin-producing plants or the remarkable role resins play for plants and people. Plant resins tell the whole story about fascinating adhesive products. This comprehensive and integrated discussion of resins will appeal to naturologist and resin evolutionist as a hydrocarbon secretion of many plants particularly from coniferous trees. Resin is different from an aqueous compound obtained from plant secretions. It is generally a highly viscous liquid may be gel, pseudoplastics or artificial polymers that solidify over a period of time. Various environmental pollutants have a major influence on human health. These toxic compounds have been linked to adverse health effects including carcinogenesis due to exposure. Counter measures have been taken against discharges into the air and water environments. Bioresins are an appropriate alternative [1].

II. ORGANIC BIORESINS

The term ‘Bio-derived Adhesive’ includes natural material, non-mineral or non-petroleum based, organic and agro waste or after moderate changes are capable of reproducing the property of synthetic resins. The following constituents contribute to resin property: lignins, carbohydrates, unsaturated oils, liquefied wood and wood welding by self-adhesion. These bioresins may be superimposed with natural or synthetic fibres creating natural fibre composites or biocomposites. Extensitve research is being carried out in the area of biocomposites [2–8]. Bioresins have replaced new synthetic adhesives for forest products industry in UK.

These resins have shown improved ease of bonding and high durability [9]. Polymers derived from renewable resources are an alternate to fossil based materials [10]. Eagerness and protection of the environment are initiating measures to seek and find environment friendly biocomposites [11]. Polysaccharides, polypeptides and lipids are a class of unique materials with multiplex constituent that can be re-engineered into new materials [12,13]. An alternative to bis-phenol from vegetable oil still remains as a challenge for scientists [14]. Linseed oil remains in lead as plasticizer or additive in the processing of PVC [15].

The attempt and approach made in hardening epoxy resins from biomass with plasticizers derived from petroleum is neither acceptable nor environment friendly [16]. Banana sap as reinforcement for bio composites has been reported [17–19]. Adhesive bonding of wood in wood industry over the past 150 years has been the key factor for the effective use as raw material. Its significant increase in the future with the development of novel adhesives and wood products is anticipated. In 3500 BC, the production of intarsia shows the earliest use of wood adhesive in Egyptian pyramid findings [20]. When the adhesives developed from biological source showed poor moisture, Reed Furniture; maker of his time in 1830’s developed an efficient bending techniques for solid wood without adhesive for furniture production showing excellent properties (unclear statement; please rewrite). Later in 1940 synthetic resins dominated market because of ease in handling, possible manipulation, and adjustability of viscosity, moisture free and economical.

Chimar Hellas, a private research institute with a forum in the development of adhesives and glues for the wood-based panels industry, focused on environment sustainability and has already developed thermosetting phenol-formaldehyde resins where a substantial part of phenol was replaced by organic materials from renewable resources [21]. In recent years, formaldehyde emissions from wood products have been forcing many changes in the wood adhesive market.

The American Society for Testing and Materials (ASTM) defines a bio based material as an organic material in which carbon is derived from a renewable resource through biological process [22]. Efficiency of bioresins is shown by its properties and contents. It is free from petroleum and carbon neutral. The world renounced producers such as; John Deere, which is building bioresin tractor bodies and Boeing Airbus is flipping old air craft to bioresins. Nowadays, most of the materials from telephones to food packaging are made from bioresin [23].

III. APPLICATIONS OF BIORESINS

1. Bioresins can be used as natural, sustainable alternatives to traditional synthetic materials [24].
2. A wide range of test adhesives has been derived from natural oils (bioresin) such as vegetable oils (rapeseed, soybean, sunflower) [25].
3. Blends and part substitutions of petroleum based resins with bioresins are an increasing way of introducing the technologies into the wood industry [26].
4. Fully biobased composite boards in which the fibre component is made from hemp, flax or timber and a bioresin are viable and an attractive concept.
5. Increased cost is a hindrance to the development of bioresins. However, novel technologies have made the process simpler and economical.
6. Biofuel technology and green chemistry routes (the bio refinery concept) are racing to meet the demand for crop based fuels and other platform chemicals. This will present significant challenges and competition for use.
7. Improvement in the performance of bioresin adhesives is a key focus of current research.

IV. CONCLUSION

The adhesives industry is under pressure to find a solution to solid waste disposal crisis in compliance with environmental and safety legislation. It is clear that in the medium to long term future (5–20 years), the substitution of less sustainable adhesives such as; synthetic resins will occur with green chemistry adhesives derived from bioresin feed stocks. This report considered the scientific and economic drivers behind the ongoing vigorous research in this area on bioresins being: health, safety and environment concerns and sustainability.

Increased use of synthetic and natural products is releasing harmful toxins into the environment. This leads to the depletion of natural resources and creates environment imbalance. Therefore, awareness is expressed by the media and different government sectors towards environmental sustainability. Industries are targeted, compelled to meet challenges to produce improved environment friendly products with competitive performance. Bioresins are emerging industrial products derived from natural renewable components. Biobased resins made from organic and agro wastes offer a sustainable alternative to synthetic resins.

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