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Scott Doughman, Sreerama Krupanidhi, and C.B. Sanjeevi

Introduction

Omega-3 rich algae oil is a safe and effective vegetarian food. *Schizochytrium* algae are derived from single strains cultured, grown, and extracted for their internal store of edible triacylglycerol oils. *Schizochytrium* oils are the most widely developed and characterized for their nutritional lipid components. These organisms produce both saturated and unsaturated fatty acids de novo, although principally produced in enclosed tanks for their long-chain polyunsaturated fatty acids [1, 2]. *Schizochytriums* are known colorless heterokonts, primitive members of the kingdom Chromista, which are natural to marine food chains or non-marine habitats found on decomposing plant material [3].

Algae oil effectiveness has been investigated in clinically relevant nutritional studies in reference to the very long-chain omega-3 fatty acid docosahexaenoic acid (DHA). Clinical levels of DHA in algae oils are reported to be 35–55 % DHA (wt/wt). However, along with the omega-3 DHA, the omega-6 docosapentaenoic acid, DPAn-6, is another significant fatty acid of importance in the oils, reported at 7–15 % DPAn-6 (wt/wt). In the human body, each bioactive lipid has distinct and relevant roles in the neuronal and cardiovascular systems for cell and tissue structure and function, also resident in lipoprotein phospholipids [4]. These lipids are both cell building blocks in neuronal plasma membranes, have twenty-two carbon chain

lengths, and are terminal lipids in their respective synthetic fatty acid pathways [5]. Algae oil DHA and DPAn-6 together improve cardiovascular risk factors in healthy men and women [6, 7]. The effective clinical use as a vegetarian food oil has been repeatedly proven to substitute for clinical fish oils.

The value of vegetarian algae oil is also suggested because DHA and DPAn-6 of similar ratios are present in a variety of foods related to growth and development, abundant in eggs, and breast milk, for example. The ratio of DHA to DPAn-6 in human breast milk is reported to range normally from 1:1 to 1:6 [8]. The ratio of DHA to DPAn-6 in *schizochytrium* oil is about 1:3–1:6, within the range found in breast milk. Because algae oils and fish oils nearly always demonstrate equality in dose-dependent omega-3 studies, DHA alone is proven to be broadly effective compared to any other combination of long-chain omega-3s [9].

While more study is needed in persons, the value of the algal DHA/DPAn-6 ratio is not related to fish oils of different omega-3/omega-6 ratio compositions. The observation of native lipid composition in human tissues suggests algae oil lipid ratios, DHA with some DPAn-6, and with about 0.5–3 % eicosapentaenoic acid (EPA) is similar to the inherent order of abundance of these lipids in a person [4].

In contrast, fish oil EPA and DHA ratios are fundamentally different than how these exist in a person. EPA is generally two-thirds of the omega-3 in fish oil and DHA is only one-third of the long-chain omega-3s. What is increasingly being learned from omega-3 studies in people is that the lipid ratios of oils consumed will enter the blood and transiently exist for several hours. Because algae oil provides a preformed ratio of fatty acids more similar to steady-state tissue ratios and fasting ratios of these lipids, this is suggestive that algae oil may be less of a metabolic challenge for the systems to process.

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VAT DYEING OF FABRIC BY SELECTING AN APPROPRIATE REDUCING AGENT AS PER REDUCTION POTENTIAL OF DYE

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Abstract

Dyeing of fabric using vat dye is carried out by using reducing agents, to reduce the dye. The reduction potential of reducing agent has to be matched with the dye for proper dyeing; otherwise the problem of over reduction and under reduction may arise and leads to the change in shade. In conventional vat dyeing process, the vat dye is dissolved using sodium hydrosulphite (hydrose), which is a powerful reducing agent followed by solubilising with sodium hydroxide. In this study, reducing agents with different reduction potential at different concentration have been used for dyeing the cotton fabric with vat dye. And the comparisons of different reducing agents and their blend have been observed in terms of dye pick up and fastness property. It has been found that for the dyes which are having lower reduction potential, in that case the problem of over reduction can be avoided by using a mild reducing agent like hydroxyacetone in combination with hydros.

Keywords: Vat dyes, Reducing agent, Hydroxyacetone, Hydrose..

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BIOETHANOL A SOURCE OF RENEWABLE ENERGY

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Abstract

Bioethanol is widely recognized these days as a very promising alternative source of energy. Biomass is considered as a safe and clean material with unlimited availability and high potential to be used as a renewable source for the production of energy and alternative fuels. Biofuel derived from renewable feed stocks are environmentally friendly fuels. The process of turning coal into liquid produces more carbon dioxide emissions than conventional gasoline does. This work suggests that bioethanol produced from potato peel is the best alternative fuel and this also avoids the environmental pollution problem.

Keywords Alternate Fuels, Global Warming, Potato peel, bioethanol.

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free energy (ΔG°), standard enthalpy (ΔH°) and standard entropy (ΔS°) were evaluated. The adsorption of Zn(II) on Eucalyptus bark powder indicated its spontaneous and endothermic nature. It was concluded that Eucalyptus bark powder, which has a very low economic value used for the effective treatment of aqueous solutions contaminated with Zn(II).

A simple and inexpensive method was developed with high performance liquid chromatography with PDA detection for determination of Tolterodine. The chromatographic separations were achieved on (250) x 4.6 mm, 5.0 μ m make; YMC-Pack ODS-AM, 120A column employing Acetonitrile: methanol and Water pH 7.0, in the ratio of 60:20:20 v/v/v as mobile phase with gradient programmed at flow rate 1.0 mL/min was chosen. The detector wavelength of 230 nm was employed.

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Bioethanol a Source of Renewable Energy

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Abstract

Bioethanol is a readily available, clean fuel for combustion engines made from plant-based feed stocks. It produces considerably lower emissions on combustion and it only releases the same amount of carbon dioxide as plants bound while growing. With advanced, energy saving production technology bioethanol can considerably reduce the climate relevant greenhouse gas emissions from transport and traffic. Bioethanol is widely recognized these days as a very promising alternative source of energy. Biomass is considered as safe and clean material with unlimited availability and high potential to be used as a renewable source for the production of energy and alternative fuels. This work suggests that bioethanol produced from potato peel is the best alternative fuel and this also avoids the environmental pollution. As a matter of fact, bioethanol has a very promising potential. As an alternative to the traditional diesel or gasoline fuel, it is expected to yield the significant energy security and environmental advantage to its potential utilization for future prospective. Potatoes are the second most used food in the world. Potato peel is one such product which is abundant and of very low utility and low price. Potato peels are the waste products in chips and wafer industries. They are produced in abundance and discarded or in some cases used as feedstock for cattle. The enzyme culture used in the process needs to be processed under controlled conditions. The enzymes used in this treatment are *Saccharomyces cerevisiae*. The *Saccharomyces cerevisiae* cultures were maintained by sub culturing them every 15 days on sabouraud's agar slants, followed by 24 h incubation at 25°C. The cultures were stored at 4°C for further use. Old culture was inoculated in YPD and incubated at 25°C for 24 hours. These inoculums were used to inoculate sterilized potato peel. Optimization of the culture conditions involves optimization of media and operating conditions. Optimization of media was done by observing the growth pattern of *Saccharomyces cerevisiae* on various media like glucose (5%), sucrose (5%) and then YPD was analyzed. Optimization of pH of *S. crevice* was inoculated at different pH like 4, 5, 6, 7 and optimum growth was checked by measuring the absorbance at 620nm in digital colorimeter before and after incubation at 24 h, 48 h and 72 h intervals.



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DEVELOPMENT OF POROUS STRUCTURED NANO SPHERES AS ANODE

B. Nageswararao¹, M. Venkateswarlu³, V. Madhusudhan Rao¹, N.Satyanarayana^{2*}

Abstract

Rechargeable lithium ion batteries (LIBs) with high energy density are considered as the leading candidates for portable electronic devices, electric vehicles (EVs) and hybrid electric vehicles (HEVs). Graphite with a theoretical specific capacity of 372 mAh/g has been the most employed anode material in commercial LIBs. However, the increasing demand for high energy density batteries has driven the research efforts to develop electrode materials from low cost, durable and nontoxic materials with high reversible capacity and high rate capability. Recently, metal oxides have gained much attention as anode materials in LIBs because of their high capacity compared to graphite. Hematite α -Fe₂O₃ is found to be a potential anode candidate for LIBs, because of its low cost, high stability, non-toxicity and environmentally benign. Recently, nano structured porous materials have received great interest as anodes in LIBs because, the nano size shortens the Li⁺ ion diffusion lengths, leading to an improved rate capability, while the porous nature minimizes the volume changes during charge/discharge reactions, leading to an enhanced cycle ability. Hence, an attempt has been made to synthesize porous structured α -Fe₂O₃ nanospheres by microwave assisted hydrothermal method. The prepared sample was characterized by X-ray diffraction (XRD), Raman spectroscopy, scanning electron microscopy (SEM) and transmission electron microscopy (TEM) techniques. Further, lithium ion battery was fabricated using the newly developed α -Fe₂O₃ nanospheres as anode and its electrochemical performance was evaluated through cyclic voltammetry (CV) and charge-discharge measurements. The detailed results will be presented and discussed

Keywords: Microwave synthesis, Nanospheres, X-ray diffraction (XRD), Lithium battery.

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A STUDY ON EFFECT OF ROVING HEATING ON COTTON RING YARN QUALITY

Siva Jagadish Kumar* and B Venkatesh

Abstract

In short staple spinning, every drafting process introduces irregularities in a fibre strand. Drafting irregularities affects both yarn quality and spinning performance. The one of main reason for formation of drafting waves and undrafting in drafted strand was fibre to fibre friction (stickiness). In this work, the Fibre to fibre friction is reduced by heating of roving at the break draft zone using an in house designed heating assembly based on convection principle, which can be advantageously utilized for reducing the space between the aprons thereby better control over the floating fibres. The cotton yarns with three different types of counts. From each count samples were produced with different levels of temperature by varying the space between the aprons. The effect of heating of roving on yarn quality was characterised by yarn unevenness, imperfections at different sensitivity levels, classmate faults, hairiness and yarn strength. The results show that the yarn imperfections and faults, hairiness and yarn unevenness are affected by yarn produced with heating of roving and in the case of less spacer size give better yarn quality with good spinning performance.

Keywords: Floating Fibers, Fiber to Fiber friction, Drafting irregularities.

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