

TECHNOLOGY ROUNDUP

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- Technology for Flora Industry
- International Coal Conference
- International Conference on Information & Communication Technologies
- International Conference on Agricultural, Biotechnology, Biological and Biosystems Engineering
- International Conference on Bioinformatics, Computational Biology and Biomedical Engineering
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- Health Systems in Asia: Equality, Governance and Social Impact Conference

Indigenous Technology

Characteristics Assessment of Cooking Oil and Vanaspati Ghee

Vegetable oils are derived from plant sources like soybeans, palm, corn, melon, groundnut, sheabutter, coconut, etc. Some of these vegetable oils are used for domestic (edible) and industrial purpose (oleo chemicals). Many oilseed crops are grown in Pakistan as a source of vegetable oil. These crops are ground in two categories viz. conventional and non-conventional oilseed crops. Rapeseed-mustard, groundnut and sesame are conventional crops and are being grown in the country for a long period. Sunflower, soybean and safflower are non-conventional crops. There are also some oilseed crops, which are mainly used for industrial purposes, such as linseed and castor.

The quality of fats plays very important role in food processing technology. Oxidation of fat is the main reason of deterioration in the quality of foods and can directly affect many quality characteristics such as flavour, colour, texture, nutritive value, and safety of the food. The quality and dietary character of the edible oil have been a topic of concern among food scientists, nutritionists and consumers. Lipids provide a concentrated source of energy and essential fatty acids through dietary intake. They also serve as important constituents of cell walls and carrier of fat-soluble vitamins. In addition, lipids provide flavour, texture and mouth feel to the food. Vegetable oils, made up of lipids, are very common commodities in our daily life. A variety of fats and oils are widely available for consumption in the form of cooking oil, health products and food ingredients, as well as for the manufacture of cosmetics, soap and surfactants.

Vanaspati are manufactured by hydrogenation of vegetable oils, during which a reduction in the unsaturation of oils and an increase in the isomerization at the double bonds take place. The trans isomers thus formed affect the physical and chemical properties of the final products as they have higher melting points and greater stability. Edible fats and oils represent one of the primary constituents in the formulation and manufacture of products by the food industry. Extracted oils from wide range of different sources undergo supplemental transformations such as fractionation, hydrogenation, and interesterification prior to utilization for the diet. During processing, a variety of physico-chemical quality parameters of oil are monitored, including the determination of free fatty acids, moisture, peroxide value, iodine value, and saponification number to name just a few. There is strong evidence that rise in per capita income is related to an increase in cooking oil and vanaspati ghee consumption. These products are essential food items for human utilization. In this scenario there is a need to periodically monitor quality of cooking oils and vanaspati ghee sale at various stores and outlets in the country.

The research therefore, discusses the impact of processing and storage on quality of cooking oil and vanaspati ghee as reflected by change in important physical and chemical parameters. Various physico-chemical characteristics of commercial cooking oil and vanaspati ghee of different brands collected from local market have been analyzed. All the characteristic parameters were analyzed using AOCS method, while fatty acids composition of samples were determined using gas chromatography (GC) coupled with flame ionization detector (FID). Physico-chemical characteristics of all cooking oils seem comparable with each other, however, vanaspati ghee samples showed different physico-chemical characteristics due to presence of high amount of trans fat. There is direct relation between physico-chemical characteristics such as moisture and impurities, iodine value, unsaponifiable matter, saponification value, refractive index, density and colour.

Courtesy:

Pak. J. sci. Ind. res. Ser. A: phys. Sci. 2013 56(1) 6-13 refs 28

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Indigenous Technology

Design of a Cost Efficient PV Parameter Monitoring System

Raising energy demands and climate changes are the main global issues. To overcome the energy limitations and environmental pollution, the world is widely focusing on alternative and cleaner energy utilization. Minimum environmental effects, a long life and abundance of availability make the PV more popular amongst clean energies. However, there are few problems associated with PV technology which hinder its development, i.e., high cost and low efficiency. Also, the optimum reliability is considered as an additional issue in this technology. Recent research showed that by using a PV module in outdoor application in accordance with the manufacturer specification gave errors and may cause a system failure later on. It is realized that the monitoring of PV parameters in realistic condition is very essential for reliability, cost and performance improvements of a PV system. Also, the PV parameters monitoring is essential for evaluation, implementation and in returns on investment analysis of PV systems.

Presently, PV monitoring systems are complicated and expensive. The complexity in PV monitoring system is due to the use of complicated control system, to extract the maximum power from a PV module for analysis whilst designed a PV monitoring system by employing some expensive tools like a general purpose interface bus card (GPIB) and precession measurement units (PMU).

Hence looking forward to the cost issues with PV implementation and the importance of PV parameters monitoring in utilization and implementation of PV. This research designs a cost-effective PV parameters monitoring system with a considerable range of accuracy. In order to evaluate the efficiency and performance of a PV module, the monitoring of real and simulated maximum power points of a PV module, effective irradiance and area of a PV module is required to be analysed. The designed system tracks the maximum power of PV module from real time short circuit current and open circuit voltage of PV module under the computational maximum power tracking technique. Instead of using expensive pyranometer and BPW photo diodes, the irradiance is sensed via designed LDR sensor. The data logger is replaced with a database organised in PC whilst LABVIEW GUI is used for the data processing and monitoring. The accuracy of the designed system is verified by simulating it in a well known PV simulator PSIM and through real-time experimental results.

Photovoltaic (PV) parameters monitoring is very important for the implementation and optimum utilization of solar energy as electricity source. Present PV monitoring systems are based on expensive tools and complicated designs. This paper describes the design of a simple and cost-efficient PV monitoring system. The design system is composed of hardware processed by a microcontroller and a computer-based software designed in a user-friendly graphical program LABVIEW. The designed system is observed in realistic conditions and is working well.

Courtesy:

Science, Technology and Development, 2012 31(3): 244-250 refs 11

Muhammad Ali, Mahmood Khan (GIK Institute of Engineering Sciences and Technology, Topi 23640, District Swabi, K.P.K, Pakistan.), and Khasan Krimov (Physical Technical Institute of Academy of Sciences, Rudki Ave, 33, Dushanbe, 734025, Tajikistan.)

Soft Drinks Linked to Behavioral Problems in Young Children



More soft drinks are bought per capita by the people in all most all countries. These drinks are consumed by individuals of all ages, including very young children. Although soft drink consumption is associated with aggression, depression, and suicidal thoughts in adolescents, the relationship had not been evaluated in younger children. A new study finds that aggression, attention problems, and withdrawal behavior are also associated with soft drink consumption in young children.

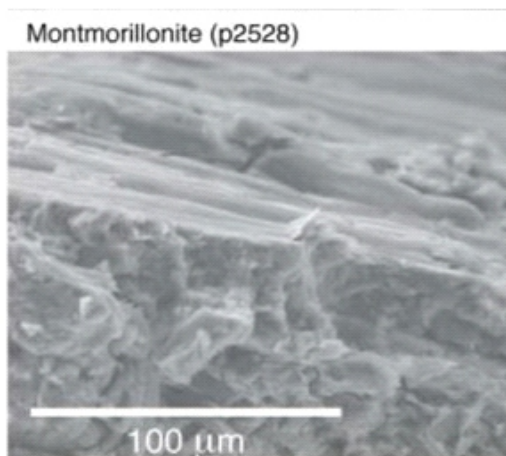
Shakira Suglia, ScD, and colleagues from Columbia University's Mailman School of Public Health, University of Vermont, and Harvard School of Public Health assessed approximately 3,000 (5-year) old children enrolled in the Fragile Families and Child Wellbeing Study, a prospective birth cohort that follows mother-child pairs from 20 large U.S. cities. Mothers reported their child's soft drink consumption and completed the Child Behavior Checklist based on their child's behavior during the previous two months. The researchers found that 43% of the children consumed at least 1 serving of soft drinks per day, and 4% consumed 4 or more.

Aggression, withdrawal, and attention problems were associated with soda consumption. Even after adjusting for sociodemographic factors, maternal depression, intimate partner violence, and paternal incarceration, any soft drink consumption was associated with increased aggressive behavior. Children who drank 4 or more soft drinks per day were more than twice as likely to destroy things belonging to others, get into fights, and physically attack people. They also had increased attention problems and withdrawal behavior compared with those who did not consume soft drinks.

The researchers found that the child's aggressive behavior score increased with every increase in soft drinks servings per day." Although this study cannot identify the exact nature of the association between soft drink consumption and problem behaviors, limiting or eliminating a child's soft drink consumption may reduce behavioral problems.

www.sciencedaily.com

Slow Earthquakes May Foretell Larger Events



Monitoring slow earthquakes may provide a basis for reliable prediction in areas where slow quakes trigger normal earthquakes, according to Penn State geoscientists.

We currently don't have any way to remotely monitor when land faults are about to move. Marone and Bryan Kaproth-Gerecht, recent Ph.D. graduate, looked at the mechanisms behind slow earthquakes and found that 60 seconds before slow stick slip began in their laboratory samples, a precursor signal appeared. This has the potential to change the game for earthquake monitoring and prediction, because if it is right and you can make the right predictions, it could be big.

Normal stick slip earthquakes typically move at a rate of three to 33 feet per second, but slow earthquakes, while they still stick and slip for movement,

move at rates of about 0.004 inches per second taking months or more to rupture. However, slow earthquakes often occur near traditional earthquake zones and may precipitate potentially devastating earthquakes. Understanding the physics of slow earthquakes and identifying possible precursory changes in fault zone properties are increasingly important goals.

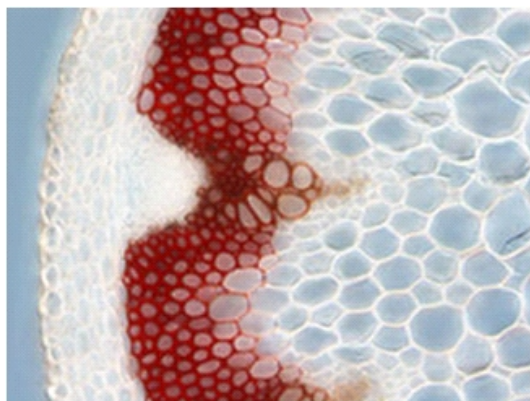
Using serpentine, a common mineral often found in slow earthquake areas, scientists performed laboratory experiments applying shear stress to rock samples so that the samples exhibited slow stick slip movement. The researchers repeated experiments 50 or more times and found that, at least in the laboratory, slow fault zones undergo a transition from a state that supports slow velocity below about 0.0004 inches per second to one that essentially stops movement above that speed. They recognized that this is complicated and that velocity depends on the friction, although they don't know for sure what is happening, but, from their lab experiments, they know that this phenomenon is occurring.

The researchers think that what makes this unusual pattern of movement is that friction contact strength goes down as velocity goes up, but only for a small velocity range. Once the speed increases enough, the friction contact area becomes saturated. It can't get any smaller and other physical properties take over, such as thermal effects. This mechanism limits the speed of slow earthquakes. They also looked at the primary elastic waves and the secondary shear waves produced by their experiments.

"Here we see elastic waves moving and we know what's going on with P and S waves and the acoustic speed," said researchers. "This is important because this is what you can see in the field, what seismographs record." They notes that there are not currently sufficient measuring devices adjacent to known fault lines to make any type of prediction from the precursor signature of the movement of the elastic waves. It is, however, conceivable that with the proper instrumentation, a better picture of what happens before a fault moves in slip stick motion is possible and perhaps could lead to some type of prediction.

www.news.psu.edu

New Possibilities for Efficient Biofuel Production



Limited availability of fossil fuels stimulates the search for different energy resources. The use of biofuels is one of the alternatives. Sugars derived from the grain of agricultural crops can be used to produce biofuel but these crops occupy fertile soils needed for food and feed production.

Fast growing plants such as poplar, eucalyptus, or various grass residues such as corn stover and sugarcane bagasse do not compete and can be a sustainable source for biofuel. An international collaboration of plant scientists from VIB and Ghent University (Belgium), the University of Dundee (UK), The James Hutton Institute (UK) and the University of Wisconsin (USA) identified a new gene in the biosynthetic pathway of lignin, a major component of plant secondary cell walls that limits the conversion of

biomass to energy. This exciting, fundamental discovery provides an alternative pathway for altering lignin in plants and has the potential to greatly increase the efficiency of energy crop conversion for biofuels.

A plant cell wall mainly consists of lignin and sugar molecules such as cellulose. Cellulose can be converted to glucose which can then be used in a classical fermentation process to produce alcohol, similar to beer or wine making. Lignin is a kind of cement that embeds the sugar molecules and thereby gives firmness to plants. Thanks to lignin, even very tall plants can maintain their upright stature. Unfortunately, lignin severely reduces the accessibility of sugar molecules for biofuel

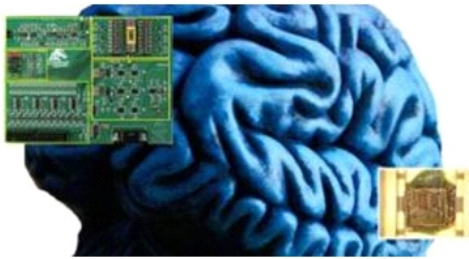
production. The lignin cement has to be removed via an energy-consuming and environmentally unfriendly process. Plants with a lower amount of lignin or with lignin that is easier to break down can be a real benefit for biofuel and bioplastics production.

For many years researchers have been studying the lignin biosynthetic pathway in plants. Increasing insight into this process can lead to new strategies to improve the accessibility of the cellulose molecules. Using the model plant *Arabidopsis thaliana*, Researchers through international research collaboration between VIB and Ghent University (Belgium), the University of Dundee (UK), the James Hutton Institute (UK) and the University of Wisconsin (USA) has now identified a new enzyme in the lignin biosynthetic pathway. This enzyme, caffeoyl shikimate esterase (CSE), fulfils a central role in lignin biosynthesis. Knocking-out the CSE gene, resulted in 36% less lignin per gram of stem material. Additionally, the remaining lignin had an altered structure. As a result, the direct conversion of cellulose to glucose from un-pretreated plant biomass increased four-fold, from 18% in the control plants to 78% in the cse mutant plants.

These new insights, published this week online in Science Express, can now be used to screen natural populations of energy crops such as poplar, eucalyptus, switchgrass or other grass species for a non-functional CSE gene. Alternatively, the expression of CSE can be genetically engineered in energy crops. A reduced amount of lignin or an adapted lignin structure can contribute to a more efficient conversion of biomass to energy.

www.vib.be/en

Computer Chip Based on Human Brain Developed



Today's computing chips are incredibly complex and contain billions of nano-scale transistors, allowing for fast, high-performance computers, pocket-sized smartphones that far outpace early desktop computers, and an explosion in handheld tablets.

Despite their ability to perform thousands of tasks in the blink of an eye, none of these devices even come close to rivaling the computing capabilities of the human brain. At least not yet. But a Boise State University research team could soon change that.

The team of expert researchers in machine learning (artificial intelligence) from Boise State University integrated circuit design and memristor devices. They have taken on the challenge of developing a new kind of computing architecture that works more like a brain than a traditional digital computer. By mimicking the brain's billions of interconnections and pattern recognition capabilities, they may ultimately introduce a new paradigm in speed and power, and potentially enable systems that include the ability to learn, adapt and respond to their environment.

The team's research builds on recent work from scientists who have derived mathematical algorithms to explain the electrical interaction between brain synapses and neurons. By employing these models in combination with a new device technology that exhibits similar electrical response to the neural synapses, they will design entirely new computing chips that mimic how the brain processes information. Even better, these new chips will consume power at an order of magnitude lower than current computing processors, despite the fact that they match existing chips in physical dimensions. This will open the door for ultra low-power electronics intended for applications with scarce energy resources, such as in space, environmental sensors or biomedical implants.

Www.aitopics.org

Forthcoming Tech Events

National Events

Technology for Flora Industry-Developing Flower Industry of Pakistan

3rd October, 2013
Haripur, Pakistan
www.irp.edu.pk

International Coal Conference

7th - 9th November, 2013
Jampur, Pakistan
Www.muett.edu.pk

International Conference on Information & Communication Technologies

14-15 December, 2013
TBA, Karachi, Pakistan
www.icict.iba.edu.pk

International Events

International Conference on Agricultural, Biotechnology, Biological and Biosystems Engineering

22-23, October 2013
Dubai, United Arab Emirates
www.waset.org

International Conference on Bioinformatics, Computational Biology and Biomedical Engineering

30-31 October, 2013
Hong Kong, China
Www.waset.org

International Conference on Mathematical, Computational and Statistical Sciences, and Engineering

6th - 7th November, 2013
Paris, France
www.waset.org

Health Systems in Asia: Equality, Governance and Social Impact Conference

13 - 16 December, 2013
National University of Singapore, Singapore
Www.healthsystemsasia.com

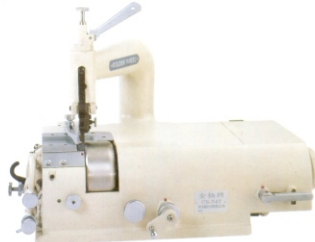
Tech & Trade Offers

New Technology in Sewing Machine Golden Wheel

CSL-1810

Features:

- Equipped with full range of parts
- Ornamental sewing (moccasin stitch) for shoes, bags, leather goods,etc.
- According to the real demand of sewn products:
- It could apply roller foot or presser foot for sewing
- It could apply normal moccasin stitch or cordinsert moccasin stitch
- Needle gauge could apply 7.5mm or 6.35mm or 5.5mm for sewing



Wide of Other Machines are:

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