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Glycerol To Propylene Glycol

Propylene Glycol Side Effects \u0026 Dangers by Dr. Berg Bioconversion of Glycerol to 1,3-Propanediol | Wikipedia audio article Propylene glycol and glycerin purification experiments Biotranformation of Glycerol to Propandiol Making THC Vape Juice: Vegetable Glycerin \u0026 Propylene Glycol Explained WBW - Propylene Advantage Welcome To GlycerinSupplier.com! | Vegetable Glycerin \u0026 Propylene Glycol USP What does propylene glycol mean? Analysis of Glycerin and Propylene Glycol in pharmaceutical dosage How To Make Texapon Gel (SLES) DIY HOW TO MAKE GLYCERIN AT HOME HOW TO MAKE TEXAPON GEL (SLES)| NEW METHOD How to make glycerine at home□diy glycerine only 2 ingredients □cook homemade glycerine□ DIY□Transparent base soap with recipe,without cook and propylene glycol□ Is Vegetable Glycerin Healthy? How-to: Make a Vegetable Glycerin Tincture is Potent How to Make Vegetable Glycerin Super Immune Boosting Herbal Tincture - Alcohol Free! Transparent Glycerin Soap Base Making from scratch without Alcohol and No Stearic Acid From Oil to Glycerin Synthesis : The Fascinating Synthesis Process Explained! How to make Glycerine (Glycerol) Propylene Glycol Propylene Glycol Poolshock reacting with 50:50 Propylene Glycol / Glycerine What is Propylene Glycol Monostearate (PGMS) Emulsifier? Properties, Types \u0026 Uses in Food Is Propylene Glycol Safe for Vaping Find Out! The difference between PG (Propylene Glycol) \u0026 VG (Vegetable Glycerine) What it means for your vape Vegetable Glycerin (VG) vs. Propylene Glycol (PG) Propylene Glycol Propylene Glycol Plant Based or Petrol Based You Decide! Glycerol and propylene glycol liquid dispenser | STONE HMI solutions

Catalytic Conversion of Glycerol and Sugar Alcohols to Value-added Products
Heterogeneous Catalysis of Glycerol to Propylene Glycol Over Copper Chromite
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Catalytic Conversion of Glycerol to Value-added Acetol and Propylene Glycol

ELLE VANESSA

Catalytic Conversion of Glycerol and Sugar Alcohols to Value-added Products

BoD – Books on Demand

This research is focused on developing a method that is applicable to the industrial-scale production of propylene glycol from glycerol with considerably high conversions and yields. The fundamental understanding behind this glycerol technology paves the way for future work on exploring some more commodity chemicals that will be derived from natural resources. Acetol was successfully isolated from dehydration of glycerol as the transient intermediate indicates that the reaction process for producing propylene glycerol with high selectivity can be done in two steps. Reactive distillation technology was employed to shift the equilibrium towards the right and achieve high yields. This catalytic process provides an alternative route for the production of propylene glycol from renewable resources. The low-pressure vapor-phase catalytic processing using copper-chromite catalyst has been proven as feasible for producing propylene glycol from glycerol. This approach was demonstrated in a continuous process to address the concerns of scalability and suitability for large scale production. The vapor-phase reaction approach allows glycerol to be converted to propylene glycol in a single reactor. A two-step reaction process to produce propylene glycol from glycerol via an acetol intermediate was proposed and validated. A large scale process is thereby potentially viable.

Heterogeneous Catalysis of Glycerol to Propylene Glycol Over Copper Chromite Academic Press

Glycerol to Propylene GlycolCatalytic Conversion of Glycerol to Propylene GlycolSynthesis and Technology Assessment

Propylene Glycol Production from Glycerol - Cost Analysis - Propylene Glycol E11A Intratec

This report presents a cost analysis of Propylene Glycol production from glycerol using a vapor-phase process. The process examined is similar to Davy Technologies process. In this process, technical grade glycerol (99.5 wt% glycerol content) is used as feedstock and ethylene glycol is generated as by-product. This report examines one-time costs associated with the construction of a United States-based plant and the continuing costs associated with the daily operation of such a plant. More specifically, it discusses: * Capital Investment, broken down by: - Total fixed capital required, divided in production unit (ISBL); infrastructure (OSBL) and contingency - Alternative perspective on the total fixed capital, divided in direct costs, indirect costs and contingency - Working capital and costs incurred during industrial plant commissioning and start-up * Production cost, broken down by: - Manufacturing variable costs (raw materials, utilities) - Manufacturing fixed costs (maintenance costs, operating charges, plant overhead, local taxes and insurance) - Depreciation and corporate overhead costs * Raw materials consumption, products generation and labor requirements * Process block flow diagram and description of industrial site installations (production unit and infrastructure) Keywords: Glycerin, Davy Process Technology, DPT, Propane-1,2-diol, Hydrogenolysis, Cargill, Ashland

Scientific Literature Review of Propylene Glycol, Glycerol and Related Substances in Flavor Usage Elsevier

This expanded, revised, and updated second edition of Innovations in Green Chemistry and Green Engineering provides a comprehensive introduction to the state-of-the-art in this key area of sustainability research. Processes that meet the objectives of green chemistry and chemical engineering minimize waste and energy use, and eliminate toxic by-products. Given the ubiquitous nature of products from chemical processes in our lives, green chemistry and chemical engineering are vital components of any sustainable future. Peer-reviewed articles from worldwide experts present the latest developments on topics ranging from organic batteries and green catalytic transformations to green nanoscience and nanotoxicology. Now under the leadership of distinguished Editors from the Chinese Academy of Sciences, this volume in the Encyclopedia of Sustainability Science and Technology, Second Edition, is an essential, one-stop reference for professionals in research and industry. The book also fills the need for an authoritative course text in environmental and green chemistry and chemical engineering at the upper-division undergraduate and graduate levels.

Equilibrium Limitations and Selectivity on Conversion of Glycerol to Propylene Glycol Intratec Solutions

Focusing on real applications of nanocomposites and nanotechnologies for sustainable development, this book shows how nanocomposites can help to solve energy and environmental problems, including a broad overview of energy-related applications and a unique selection of environmental topics. Clearly structured, the first part covers such energy-related applications as lithium ion batteries, solar cells, catalysis, thermoelectric waste heat harvesting and water splitting, while the second part provides unique perspectives on environmental fields, including nuclear waste management and carbon dioxide capture and storage. The result is a successful combination of fundamentals for newcomers to the field and the latest results for experienced scientists, engineers, and industry researchers.

The Future of Glycerol Springer Science & Business Media

The goal of this work is to provide experimental measurements of thermal conductivity of water, ethylene glycol, glycerol, and propylene glycol as a function of temperature. The transient hot wire method was used to measure the thermal conductivity over temperatures ranging from 235-340 K. This work also involved in-house apparatus fabrication along with integration of data acquisition and processing software. The experiments are carried out for a fixed current of 250 mA and the resulting temperature rise of a 95.33 mm long, 25-micron radius platinum wire is used to infer the thermal conductivity using the known solution to the heat conduction equation for a continuous line source in an infinite medium. It is important to account for the variable temperature coefficient of resistance of the platinum wire as a function of temperature when seeking to obtain the correct temperature dependence of the thermal conductivity. A data reduction procedure that improves the accuracy of the reported values by identifying the onset of convection in the fluid is proposed. We use the peak value of the slope (S) obtained using a third order polynomial fit to the apparent linear region to estimate the thermal conductivity. The high-resolution data acquired at closely spaced temperature intervals is used to derive a correlation between thermal conductivity values and the fluid temperature. Additionally, numerical results for temperature and velocity field near the heated wire are also presented to help understand the non-idealities present in the experiments. The experimental temperature rise obtained from the transient hot-wire experiments is compared to computed values for water at room temperature, and a good agreement is found. There is a fair agreement between the current data sets and the very limited data for the four liquids reported in the literature. This work provides robust and comprehensive experimental data for thermal conductivities of the four common heat transfer fluids over the typical range of temperatures they are frequently used.

Catalytic Conversion of Glycerol to Propylene Glycol Elsevier

This report presents a cost analysis of Propylene Glycol production from glycerol using a liquid-phase process. The process examined is similar to Suppes process. In this process, technical grade glycerol (99.5 wt% glycerol content) is used as feedstock and ethylene glycol is generated as by-product. This report was developed based essentially on the following reference(s): Keywords: Glycerin, Senergy Chemical, Propane-1,2-diol, Hydrogenolysis

Bio-Based Solvents Royal Society of Chemistry

A multidisciplinary overview of bio-derived solvent applications, life cycle analysis, and strategies required for industrial commercialization This book provides the first and only comprehensive review of the state-of-the-science in bio-derived solvents. Drawing on their own pioneering work in the field, as well as an exhaustive survey of the world literature on the subject, the authors cover all the bases—from bio-derived solvent applications to life cycle analysis to strategies for industrial commercialization—for researchers and professional chemists working across a range of industries. In the increasingly critical area of sustainable chemistry, the search for new and better green solvents has become a top priority. Thanks to their renewability, biodegradability and low toxicity, as well as their potential to promote advantageous organic reactions, green solvents offer the promise of significantly reducing the pernicious effects of chemical processes on human health and the environment. Following an overview of the current solvents markets and the challenges and opportunities presented by bio-derived solvents, a series of dedicated chapters cover all significant classes of solvent arranged by origin and/or chemical structure. Throughout, real-world examples are used to help demonstrate the various advantages, drawbacks, and limitations of each class of solvent. Topics covered include: The commercial potential of various renewably sourced solvents, such as glycerol The various advantages and disadvantages of bio-derived versus petroleum-based solvents Renewably-sourced and waste-derived solvents in the design of eco-efficient processes Life cycle assessment and predictive methods for bio-based solvents Industrial and commercial viability of bio-based solvents now and in the years ahead Potential and limitations of methodologies involving bio-derived solvents New developments and emerging trends in the field and the shape of things to come Considering the vast potential for new and better products suggested by recent developments in this exciting field, Bio-Based Solvents will be a welcome resource among students and researchers in catalysis, organic synthesis, electrochemistry, and pharmaceuticals, as well as industrial chemists involved in manufacturing processes and formulation, and policy makers.

Dehydroxylation of Glycerol to Propylene Glycol Over Copper-zinc Oxide Catalysts

BoD – Books on Demand

Cryopreservation has many biotechnological applications in different fields. This has led to an increase in importance of cryobiology as a science that examines the effect of ultra-low temperatures on cells, tissues, organs and organisms and also the freezability of these structures, while maintaining their viability. Nowadays it is well known that this form of biotechnology can be used to solve a lot of problems such as human infertility, life threatening diseases, preservation of gametes and DNA and also biodiversity conservation. Cryopreservation Biotechnology in Biomedical and Biological Sciences describes principles and application of cryopreservation biotechnology in different research areas and includes seven chapters that have been written by experts in their research fields. The chapters included in this book are thought to improve the current understanding of the different areas of using cryopreservation biotechnology.

Experimental and Computational Studies on the Temperature Dependence of Thermal Conductivities for Water, Ethylene Glycol, Glycerol, and Propylene Glycol, Using the Transient Hotwire Method Routledge

The increase in the amount of glycerin in the market is a burden for all producers, especially those operating in the biodiesel sector: reuse options are in fact limited for the management of this by-product. Glycerol enhancement has therefore become a priority to improve the sustainability of the biodiesel industry. Nevertheless, the multifunctionality of glycerol makes it a promising precursor for different types of production (fuel/biofuel, chemical products). This conversion has therefore become a subject of multifaceted research that requires an exchange of knowledge across many sectors. In this book, different disciplines (chemistry, biology, engineering, etc.) have been taken into consideration to propose an interdisciplinary point of view on different aspects.

Processes and Systems for the Production of Propylene Glycol from Glycerol National Academies Press

Lung Epithelial Biology in the Pathogenesis of Pulmonary Disease provides a one-stop resource capturing developments in lung epithelial biology related to basic physiology, pathophysiology, and links to human disease. The book provides access to knowledge of molecular and cellular aspects of lung homeostasis and repair, including the molecular basis of lung epithelial intercellular communication and lung epithelial channels and transporters. Also included is coverage of lung epithelial biology as it relates to fluid balance, basic ion/fluid molecular processes, and human disease. Useful to physician and clinical scientists, the contents of this book compile the important and most current findings about the role of epithelial cells in lung disease. Medical and graduate students, postdoctoral and clinical fellows, as well as clinicians interested in the mechanistic basis for lung disease will benefit from the books examination of principles of lung epithelium functions in physiological condition. Provides a single source of information on lung epithelial junctions and transporters Discusses of the role of the epithelium in lung homeostasis and disease Includes capsule summaries of main conclusions as well as highlights of future directions in the field Covers the mechanistic basis for lung disease for a range of audiences

Ethylene Glycol, Propylene Glycol, Trimethylene Glycol and Glycerol John Wiley & Sons

This book aims to inform chemistry professionals, including managers and technologists, on the large potential of glycerol as versatile biofeedstock for the production of a variety of chemicals, polymers and fuels. Whilst filling a gap in the current literature, this nicely illustrated book is written in a clear, concise style and presents the numerous uses of glycerol as a new raw material which are starting to have an impact on industry worldwide. Elucidation of the principles governing the new chemistry of glycerol goes along with updated industrial information that is generally difficult to retrieve. Through its 10 chapters, the monograph tells the story of a chemical success that of converting glycerol into value added products and highlights the principles that made it possible. Whether as solvent, antifreeze, detergent, monomer for textiles or drug, new catalytic conversions of glycerol have been discovered that are finding

application for the synthesis of products whose use range from everyday's life to the fine chemical industry. Readers are also shown how a number of practical limitations posed by glycerol chemistry, such as the low selectivity encountered employing traditional stoichiometric and older catalytic conversions, were actually solved based on the understanding of the fundamental chemistry of glycerol and by application of catalysis science and technology. Readers also find a thorough discussion on the sustainability issues of bioglycerol production covering societal, environmental and economic dimensions to reflect the needs of politicians and citizens of today who require cross border research. By explaining the advantages and problems as well as offering solutions the book aids understanding as to whether biodiesel and glycerol refineries are convenient and economically sound.

A Key Cosmetic Ingredient

CRC Press
The second edition of this invaluable handbook covers converting vegetable oils, animal fats, and used oils into biodiesel fuel. The Biodiesel Handbook delivers solutions to issues associated with biodiesel feedstocks, production issues, quality control, viscosity, stability, applications, emissions, and other environmental impacts, as well as the status of the biodiesel industry worldwide. Incorporates the major research and other developments in the world of biodiesel in a comprehensive and practical format Includes reference materials and tables on biodiesel standards, unit conversions, and technical details in four appendices Presents details on other uses of biodiesel and other alternative diesel fuels from oils and fats

Effects of Propylene Glycol and Glycerol in an Electrolyte Drench on Fresh Cows

BoD – Books on Demand
Biodiesel production is a rapidly advancing field worldwide, with biodiesel fuel increasingly being used in compression ignition (diesel) engines. Biodiesel has been extensively studied and utilised in developed countries, and it is increasingly being introduced in developing countries, especially in regions with high potential for sustainable biodiesel production. Initial sections systematically review feedstock resources and vegetable oil formulations, including the economics of vegetable oil conversion to diesel fuel, with additional coverage of emerging energy crops for biodiesel production. Further sections review the transesterification process, including chemical (catalysis) and biochemical (biocatalysis) processes, with extended coverage of industrial process technology and control methods, and standards for biodiesel fuel quality assurance. Final chapters cover the sustainability, performance and environmental issues of biodiesel production, as well as routes to improve glycerol by-product usage and the development of next-generation products. Biodiesel science and technology: From soil to oil provides a comprehensive reference to fuel engineers, researchers and academics on the technological developments involved in improving biodiesel quality and production capacity that are crucial to the future of the industry. Evaluates biodiesel as a renewable energy source and documents global biodiesel development The outlook for biodiesel science and technology is presented exploring the challenges faced by the global diesel industry Reviews feedstock resources and vegetable oil formation including emerging crops and the agronomic potential of underexploited oil crops

Elsevier
The current research is based on developing an improved and fundamental understanding of technology that will allow the conversion of this crude glycerin to a propylene glycol based antifreeze product. Hydrogenolysis of glycerol to propylene glycol was performed using copper chromite catalyst. At temperatures above 200°C and hydrogen pressure of 200 psi, the selectivity to propylene glycol decreased due to excessive hydrogenolysis of the propylene glycol. The yield of propylene glycol increased with decreasing water content. The main causes for the deactivation were reduction of the cuprous chromium active species into metallic copper species, metal leaching, and blocking of sites by strongly adsorbed inorganic and organic species present in the feed or generated during the reaction. A new reaction pathway for converting glycerol to propylene glycol via an intermediate was validated by isolating the acetol intermediate. In the first step involves dehydration of glycerol to acetol with subsequent hydrogenation of acetol to propylene glycol. High acetol selectivities ([greater than] 90%) were achieved using copper-chromite catalyst and operating in semi-batch reactive distillation mode. The acetol from this reaction readily hydrogenates to from propylene glycol with selectivities exceeding 95%.
Glycerol Glycerol to Propylene GlycolCatalytic Conversion of Glycerol to Propylene GlycolSynthesis and Technology AssessmentThis research is focused on developing a method that is applicable to the industrial-scale production of propylene glycol from glycerol with considerably high conversions and yields. The fundamental understanding behind this glycerol technology paves the way for future work on exploring some more commodity chemicals that will be derived from natural resources. Acetol was successfully isolated from dehydration of glycerol as the transient intermediate indicates that the reaction process for producing propylene glycerol with high selectivity can be done in two steps. Reactive distillation technology was employed to shift the equilibrium towards the right and achieve high yields. This catalytic process provides an alternative route for the production of propylene glycol from renewable resources. The low-pressure vapor-phase catalytic processing using copper-chromite catalyst has been proven as feasible for producing propylene glycol from glycerol. This approach was demonstrated in a continuous process to address the concerns of scalability and suitability for large scale production. The vapor-phase reaction approach allows glycerol to be converted to propylene glycol in a single reactor. A two-step reaction process to produce propylene glycol from glycerol via an acetol intermediate was proposed and validated. A large scale process is thereby potentially viable.Propylene Glycol Production from Glycerol - Cost Analysis - Propylene Glycol E12A Hydrogenolysis of glycerol to propylene glycol was performed at lower temperatures and pressures using concentrated glycerol. Reactions were carried out at 180, 200, 220, and 240°C and at a system pressure of 1, 2, and 4 bars in the presence of a copper-chromite catalyst. The effect of temperature, pressure, residence time, water content, and H2: Glycerol mole ratios were evaluated. All results indicate that lower temperatures and higher pressures promote the selectivity on conversion of glycerol to propylene glycol. The amount of byproducts decreased with decreasing the residence time. Product quality correlates with lower water content. Catalyst productivity increased with decreasing H2: Glycerol mole ratio. An optimal H2: Glycerol mole ratio is near 15:1. Lower temperatures (220°C) are the preferred operated conditions to increase the catalyst productivity. The results are

also fully consistent with a two-step reaction in which the second step of conversion of acetol to propylene glycol is equilibrium limited.

Embryopathic Effects of Ivomec and Solvents Glycerol Formal and Propylene Glycol John Wiley & Sons

Processes and systems for converting glycerol to propylene glycol are disclosed. The glycerol feed is diluted with propylene glycol as the primary solvent, rather than water which is typically used. The diluted glycerol feed is sent to a reactor where the glycerol is converted to propylene glycol (as well as other byproducts) in the presence of a catalyst. The propylene glycol-containing product from the reactor is recycled as a solvent for the glycerol feed.

Study of Synthesis of Glycerol Annual Report, 12 Feb. - 15 Nov. 1970 Springer

First published in 1995: This edition of Fenaroli's Handbook of Flavor Ingredients brings together regulatory citations, FEMA numbers, Substance names and common synonyms, specifications (such as the GRAS classification by FEMA), natural sources, and permitted use levels in food into a convenient and easy-to-use reference set. The Handbook defines much of the arcane and specialized language of the flavorist, and helps update the reader on industry standards. It's a source of use levels of flavor ingredients in food approved by the FEMA expert panel. It's also a source outside of the Code of Federal Regulations (CFR) that provides both human and animal food regulatory citations for substances.

Propylene Glycol Production from Glycerol

First Published in 2018. Routledge is an imprint of Taylor & Francis, an Informa company.

The Renewable Platform Chemical

Using a 300 mL batch pressure reactor, preliminary experiments were first conducted to determine the most influential process parameters and to establish the appropriate experimental designs. Based on the preliminary results, thorough experiments were conducted to investigate the effects of reaction temperature, reaction time, and water to glycerol mass ratio by applying Raney nickel catalyst. Different reactant formulations were used to explore the possible pathways of the desired reactions leading to ethanol and propylene glycerol. A response surface regression was used to determine the optimum conditions for maximizing propylene glycol and ethanol yields.