Elimination of COD from Wastewater by Electrochemical Treatment

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Abstract

Many industrial wastewaters have been found to be highly saline content. Treatment of saline wastewater has not been easy. Biological methods are the tradition has revealed that the biological method may not be a good choice, primarily because of the inhibitory effect of high salinity on the microbial growth. With high saline content, the wastewater invariably has a rather high conductivity, because of the presence of anions and cations in the aqueous solution. Therefore, this method has been successfully employed with various types of industrial wastewater. In this paper, treatment of wastewaters by electrochemical method has been investigated. Also, the several aspects such as wastewater conductivity, PH and current density, temperature and concentration are explored to determine their effect on the treatment efficiency.

Keywords: Electrochemical Treatment, Chemical Oxygen Demand, Saline Wastewater, Wastewater Treatment

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The Study of Nanofluid Rule on Vehicles Efficiency Improvement

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Abstract

The term of nanofluids refers to a new kind of fluids by suspending nanoparticles in base fluids, which can be employed in radiator and motor oil system. In this study the effective factors responsible for vehicle fuel low efficiency, the rule of nanofluid as cooling fluid in radiator and motor oil system and the probably challenges encountered in using nanofluid was investigated. The review of investigation expressed that adding nanoparticles to vehicle radiator and motor oil system besides of heat transfer improvement and 11% fuel efficiency, more friction factor decreasing can be available using nanofluid as a new coolant.

Keywords: Nanofluid, Fuel Consumption, Heat Transfer Enhancement, Friction Reduction, Nanoparticles

Preparation, Characterization and Applications of Conducting Membranes

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Abstract
Generally, the membrane is a thin film of liquid, or more commonly solid, from polymer, ceramic or metal. In recent years, interests in the preparation and application of new family of membranes called conducting membranes have grown in various fields. For the preparation of conducting membranes, two major techniques have been introduced. The first procedure includes employment of intrinsic conducting polymers and the second procedure is modification of the prepared non-conductive membranes by coating the conducting materials like metal or conducting polymers on the surface of non-conductive membranes. Various characteristics tools including conductivity, porosity, mechanical properties, and transport of various materials across the membrane and etc. can be applied for determining the membrane characteristics.

Keywords: Conductive Membrane, Preparation Methods, Characterization, Conducting Polymers

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A Review on Solid State Shear Pulverization and its Applications

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Abstract
Solid state shear pulverization is a novel technology in polymer processing for production of new polymeric materials. By implementation of this technology various processes such as polymer recycling, compounding, and improving of mechanical-chemical properties of polymers can be enhanced. This is a continuous and one-stage process with low energy consumption. During this process, polymers are subject to high pressure and shear forces. In this paper, this technology and its applications to polymer processing is presented.

Keywords: Solid State Shear Sulverization, Recycling of Polymers, Compounding

Superheated Water Extraction and its Applications in Extraction of Compounds from Plants

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Abstract

Superheated water extraction has been shown to be feasible with particular interest in avoiding the need for organic solvents. The method is cheap and non-toxic. Also the wet sample doesn't need to be dried before extraction. Because of these characteristics this method has been more effective than traditional methods in many cases. In this article, brief introduction of the method has been provided which includes information about the extraction system and the parameters which affect extraction efficiency. Also extraction condition and analysis method of the extracts have been studied for extraction of polyphenols and phenolic compounds, antioxdants, essential oils and other compounds from plants.

Keywords: Superheated Water, Extraction, Plants, Application

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Comparative Investigation of Storage and Transportation Methods of Natural Gas via Compression, Adsorption and Hydrate

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Abstract

Due to the substantial growth of transportation vehicles, utilization of green fuels such as natural gas is regarded as one of the challenging ways against air pollution. Unfortunately, natural gas is far behind the gasoline in terms of energy per unit volume. Therefore, some alternative safe and low cost techniques are under investigation to store and transport gas in a least possible volume. Different gas storage and transportation techniques are depend upon the gas reservoir, distance to consumption market, total investment and other operation parameters and each one has its own specification. In this article, three methods of compressed natural gas (CNG), adsorbed natural gas (ANG) and natural gas hydrate (NGH) as alternative techniques for natural gas storage in vehicles as well as effective means of transporting large amounts of natural gas by ships, are considered and compared in different aspects.

Keywords: **Storage, Transportation, Compressed Natural Gas (CNG), Adsorbed Natural Gas (ANG), Hydrate**

Electrochemical Treatment of Arsenic-Polluted Waters by Electrocoagulation Process

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Abstract

Arsenic is naturally a toxic metal and is found in surface and ground water of many parts of the world. Due to the low efficiency of conventional treatment methods for achieving the standard of level (10 μg/l), it is necessary to find a new and economical method to reach this standard. Electrocoagulation process is the distinct economical and environmental choice for water and wastewater treatment. In a typical electrocoagulation process, a sacrificial electrode (Anode) is decaling to release coagulant precursors into solution. In this paper, electrocoagulation process and its affecting factors has been discussed as an effective method for arsenic removal from drinking water. The desired results were obtained by iron electrodes, which are the safest electrodes in this treatment process.

Keywords: Electrocoagulation, Electrochemical Treatment, Water Treatment, Heavy Metal, Arsenic Removal