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TECHNOLOGY LICENSING OPPORTUNITIES

SAMPLE PREPARATION AND STORAGE LICENSING OPPORTUNITIES

There are several technologies in the area of sample preparation and storage available for licensing either as a package or on an individual basis.

Methods of isolating nucleic acids under reduced degradation condition

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Invention Summary

A method for isolating biomolecules from a biological sample, in particular isolating nucleic acids, consisting of biomolecule extraction, buffer reconstitution and elution.

Background

Preparation and manipulation of high quality nucleic acid is a significant step in molecular biology. The purified nucleic acids isolated from various sources are required for subsequent molecular or forensic analysis. Various methods can be used to extract, isolate and purify nucleic acids for a variety of applications, such as analyte detection, sensing, forensic and diagnostic applications, genome sequencing, and the like. The conventional methods for nucleic acid sample preparation generally include isolation of the sample, extraction of the intracellular components, purification of the nucleic acids, and post-processing treatment for stabilizing the end product. However, the conventional method is a time consuming, labor intensive process with a risk of contamination and nucleic acid degradation.

There is a need for a method of isolating nucleic acids using an automated fluidic device under reduced nucleic acid degradation condition, with better nucleic acid storage capacity and with minimum human intervention. This requirement extends to various applications including basic research, forensic study, disease detection, analytical purposes, and more. Therefore, a method for isolating nucleic acids using an automated field-able fluidic device is desirable that includes cell lysis, nucleic acid extraction, and purification processes with minimal human intervention.

Technology

Isolation and purification of nucleic acids from a wide variety of samples including bacteria, plants, blood, or buccal swabs are simplified in a greater extent using various methods. The methods allow extraction of nucleic acids from the matrix and subsequent storage as needed. The methods may be adapted for various downstream applications.

In general the methods includes the following steps:

- applying the biological material on a substrate impregnated with one or more cell lysis reagents;
- applying a fluid to the biological material applied on the substrate;
- extracting the nucleic acids from the biological material applied on the substrate; and
- collecting the extracted nucleic acids in a substantially intact form, wherein the collected nucleic acid has a molecular weight greater than or equal to 20 kb.

Preparation of Glassified Biological Reagents

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Granted: US8900525, AU2007297484B2, JP5989957B2, CA2663440C, EP2063866B2, CN104774924A
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Invention Summary

The long-term storage of biological materials and reagents in a glassy, porous state. In particular, methods of making and storing these materials and reagents using a multi-well plate.

Background

Few biologically active materials are sufficiently stable so that they can be isolated, purified, and then stored in solution at room temperature. Typically, biological reagents are stored in a glycerol solution which is maintained at temperatures of 4° C., −20° C., or −70° C. They may be stored in bulk and then combined with other reagents before use.

In preparing reagents for convenient and efficient testing of biological samples, it is frequently important to obtain dry chemical blends in uniform, discreet amounts. One type of carrier or filler which has been used to stabilize biological reagents is glass-forming filler materials. The biological reagent solutions are incorporated into the glass-forming filler materials (which are water soluble or a water-swellable substance). They are then dried to produce a glassy composition which immobilizes and stabilizes the biological reagent

There are currently a number of dried molecular biology products on the market. However, some of these are made by a process that is rather cumbersome, and involves extensive manual work. Other products require refrigeration when dried. There is a need for an improved process for the generation of ambient temperature dried reagents.

Technology

A method of making a dried reagent preparations that includes the following steps:

- providing an aqueous solution of at least one buffered biological reagent;
- mixing a glass forming filler material with the buffered reagent solution to form a mixture where the concentration of the filler material is sufficient to facilitate formation of a glassy, porous composition;
- dispensing the mixture in the form of substantially uniform droplets into wells of a multi-well container, where the multi-well container is a polystyrene plate and where a single droplet is dispensed into each well;
- placing the polystyrene plate on a metal mould where the outside wall of each well of said multi-well polystyrene plate is in contact with a well of the metal mould;
- after the previous step, drying the droplets in the container to form the reagent preparation; and
- collecting the dried droplets into a reagent bottle for room temperature storage of the dried reagents;
- where the reagent preparation is water soluble and has a Tg sufficient for room temperature stability.

High Capacity Redox Electrodes and Their Use in Cell Lysis

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Invention Summary

Oxidation-reduction (redox) polymers, their manufacture, and use, for example in cell lysis.

Background

Redox polymers are highly regarded electrode materials for many research fields, including basic polymer science, electronics and optoelectronics, photovoltaics, capacitors, rechargeable batteries, biosensors, and novel cell systems. Redox polymers may have properties that include high conductivity, high stability, and/or good optical transparency, which could be useful in these fields.

The redox polymers can exist in a conducting state, where the polymer is doped to allow formation of positive charges along the conjugated backbone. Anions from a supporting electrolyte or anionic copolymer allow the redox polymer to function as an electrode material. In most of the applications these materials are currently used in, only low voltages (e.g., less than 5 V) are required and applied to the films. Applying potentials much greater than the oxidation potential of the redox polymer (i.e., over-oxidation) results in the degradation of the conducting films. Therefore, typically in thin films of redox polymers, only low voltages can be applied to the film to prevent decomposition of the film, which would render the film electrochemically inactive, destroying the electrode.

Further, with respect to the manufacture of such electrodes, industrial application of common conductive polymers, such as polythiophenes, polypyrroles and polyanilines, has been limited due to the poor mechanical properties and processability of the polymeric material. In general these polymers are only slightly soluble in aqueous and most common organic solvents, making solution processing techniques for film formation difficult. Additionally, thick films formed from the conducting polymers are generally brittle and therefore do not have good mechanical properties.

Technology

This technology relates to the manufacture and use of redox electrodes and their use in cell lysis. The redox electrodes can be manufactured using a hybrid material approach, such as using a redox polymer in combination with a support substrate, such as cellulose fibers or paper. The redox electrodes are suitable for use at voltages greater than 25 Volts.

The invention includes an oxidation-reduction (redox) electrode, encompassing:

- a support substrate comprising one or more of particles or fibers; and
- a redox polymer combined with the support substrate particles or fibers and having a thickness greater than 1 micron with respect to the surface of the support substrate.

It also includes a method for manufacturing a redox electrode, comprising of:

- blending an aqueous dispersion of a redox polymer with cellulose fibers to form a slurry;
- solution casting the slurry into one or more molds each having a form factor corresponding to the redox electrode to form a respective redox electrode in each mold; and
- recovering the respective redox electrode from each mold.

Device and method for drying biological sample on substrate

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Invention Summary

Methods for drying biological samples on a substrate for preservation and a device for drying and preserving biological samples.

Background

Biological sample storage and preservation is desirable as the preserved sample can be used for various applications, such as analyte detection, sensing, forensic and diagnostic applications, genome sequencing, whole-genome amplification, and the like. The sample storage and preservation require sample drying on a substrate.

Some of the currently used devices for preservation of samples on paper substrates can be slow or time consuming. An incomplete or slow drying affects the stability of the sample which could generate inconsistent results in subsequent analyses of the preserved samples. A time consuming method of drying a sample limits application of the substrate to use in a lab facility or other time sensitive applications.

A number of portable heat sources, particularly for applications to the heating of food are known. The portable heat sources have a number of disadvantages, including the low efficiency and formation of flammable and/or toxic by-products that may be harmful for biological samples. Chemical heat pads or chemical heaters are also known to evaporate various solvents, however the chemical heaters employ corrosive chemicals, for example, the reaction of sodium hydroxide with hydrochloric acid.

A substrate with a heat source, which is safe during operation, storage and transport, convenient to use and efficient to generate required heat for biological sample drying is highly desirable. Accordingly, there is a need for a method and a device that dries a biological sample in a minimal time without affecting the quality of the sample for subsequent storage and analysis.

Technology

This Cytiva invention provides methods and devices for drying biological sample for preservation or storage. The methods allow drying of a biological sample disposed on a substrate made of a sample loading area and a heat source. The methods include activating the heat source present on the substrate for generating heat, heating the substrate followed by drying the biological sample deposited on the substrate. The methods use controlled heating of the substrate at high temperature to accomplish sample drying in minimal time without affecting the sample.