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RADAR MONITOTING OF SEASONAL BIRD MIGRATION OVER CENTRAL ISRAEL

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ABSREACT

A radar ornithological station has been created based on the meteorological radar MRL-5 and a specially designed algorithm. The system enables to plot radar charts within the radius of 60 km combining meteorological data with vectors of bird field flying at different heights and pass these charts online over to air traffic control operators. The data accumulated in the study made it possible to obtain certain characteristics of seasonal bird migration over Central Israel. The system and the results of the study have become an integral part of ensuring air safety for Israeli military aircraft.

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BIOSPHERE REVERSIBILITY AS THE MAJOR FACTOR OF STRUCTURAL SUSTAINABILITY OF THE SYSTEM "HUMAN BEING – NATURE"

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ABSTRACT

Taking into account the law of Vernadsky-Bauer, the present article proposes a method of realization of Vernadsky's ideas. Indicated herewith is the necessity, under interaction of two natural, i.e. evolving subsystems, to use the principle of perturbation management as set forth by the Manusov-Figovsky regulation. Described is the anthropogenic sub-climax of the ecosystem lower stratum as a precondition for preservation of the entire ecosystem structural sustainability.

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NATIVE NANOOBJECTS AND BIOTECHNOLOGY INCREASING THEIR STABILITY TO ENVIRONMENT UNFAVORABLE FACTORS

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ABSTRACT

It is well known that many kinds of insects leave their secretion of different nature on plants surface. As such insects we can consider cotton aphid (Aphididae). The structure of its secretion includes sugar, fibers, pigments and other natural substances. Strong fluctuations of biotic and non-biotic factors can form in these ecological niches dominating kinds of microorganisms, adaptive to extreme environmental conditions. In analogy with polymeric systems, we consider aphid's secretion as passive nanostructures, possessing specific adhesive durability; and this durability, on the one hand, is provided by the changeable nature of substrate (for example: surface of a leaf depending on its age) and adhesive – in our case it is insects secretion. On the other hand, adhesive durability is provided by adhesive's penetration in leafs pores with sizes 15-20 nm. We think that along with the known mechanism of leaf dehydration owing to cotton aphid eating feed cellular we can realize other processes resulting in dehydration of plant parts. In micro biota which is formed on insects' secretion there can live microorganisms ferment systems of which can work for destruction of cellulose and its derivatives up to oligosaccharides with different molecular mass and their monomers.

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PRODUCTION OF FRESH WATER BY EXHAUST GAS 0F ELECTRIC AND HEAT PLANTS

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ABSTRACT

A new, cheap method for the extraction of freshwater from the sea which is fundamentally distinct from all existing methods that extract freshwater from the sea water is proposed. This method uses the hot exhaust gas (smog) of industry (after production process, example, after gas turbine of electric generator) and sea water. By using the temperature difference productively, this method needs comparatively small energy input -- only for pumping water and air, not for heating or cooling. This new environmentally friendly method may be used at any point in the Earth located not far from any sea. There are three working versions: (1) Underwater heater and tube cooler; (2) Douche heater and douche coole; (3) Underwater heater and underwater cooler. The installation also clears the exhaust gas from ashes and soot, sulfur dioxide (SO_2). The water having the high concentration carbon dioxide (CO_2) may be used for growing algae for biofuel and feed.

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NONISOCYANATE POLYURETHANES BASED ON CYCLIC CARBONATES:
Part 1
CHEMISTRY

INTRODUCTION

The polyurethane (PU) market today amount to about 5 % of the total polymer market and the worldwide consumption of PU has increased steadily. 80 % of PU productions come to resilient and rigid foams and 20 % come to solid PU (elastomers, coatings, adhesives, etc.) [1].

At the same time, conventional PU have an inherent weakness depending on their molecular composition. Van der Waals forces mainly sets physically and mechanically properties of PU. The strength of these bonds is significantly lower in energy, however [1]. Therefore PU unsatisfactorily stands up to the dynamic load, especially at elevated temperature. Also, the involvement of toxic components, such as isocyanates, in the fabrication process renders PU production extremely toxic and dangerous. People exposed to isocyanates can develop a range of short-term health problems. More seriously, isocyanate exposure can lead to long-term asthma and dermatitis if individuals become sensitized. Sensitization is a condition in which the breathing or skin conditions can return with increasing severity on further exposures to the original sensitizing agent or to similar substances, even at very low exposures [2].

Cyclic carbonates (CC) are a comparatively new class of raw materials for preparation of high performance “green” heterochain polymers. CC can be prepared using different synthetic methods. In particular, the cycloaddition of CO_2 into epoxides to afford five-membered cyclic carbonate with versatile reactivity and the subsequent reaction between the cyclic carbonate and aliphatic primary amine forming urethane linkage have been the active subjects of investigations since they allow non-isocyanate polyurethanes (NIPUs) to be prepared. Polycarbonates may be prepared also by polymerization of mono cyclic carbonates containing C=C double bonds. Recently some reviews devoted to aliphatic cyclic carbonates of different size and type were presented [3–6].

By modifying the structure of the polymer, a new and promising method of raising some mechanical properties and hydrolytic stability is introduced and readily displayed in NIPU – a modified polyurethane material with a lower permeability, increased resistance properties, and a safe fabrication process. No volatile or non-volatile NIPU are produced by reaction of poly(cyclic carbonate) and polyamine, resulting in pore-free polyhydroxy urethanes [3–10]. Plurality of intra- and intermolecular hydrogen bonds [11-13] as well as no contamination of unstable biuret and allophanate units [14] seems to be responsible for lowering the susceptibility of the backbone to hydrolysis, resulting in substantial increase in the chemical resistance.

Part 1I
APPLICATION FOR FLOORING AND COATINGS

INTRODUCTION

Industrial floors are one of basic elements of a building and simultaneously its most loaded part. The primary function of a floor is to act as a work surface for the manufacture, storage and/or movement of raw materials or finished goods. Floors experience the enormous loadings connected with abrasive and mechanical deterioration, thermal loadings, chemical and impact influences, etc.

The general requirements for industrial floors are:

1. ***Wear resistance***
   Floors are exposed to very significant abrasion influence under the operating conditions. Abrasive deterioration is the most destructive factor attacking on floors.

2. ***Mechanical loads resistance***
   Where floors are exposed to the greatest mechanical deterioration coverings with raised strength characteristics should be applied. Heavy load trolleys with small diameter wheels produce significant shear stresses in covering.
3. ***Impact resistance***
   Falling of heavy articles on a floor should not results in damage of floor covering solidity and defects.
4. ***Chemical resistance***
   The floor covering should protect the substrate from destroying influence of chemically aggressive media and to keep in this case its operational characteristics
5. ***Temperature resistance***
   Temperature difference is one of the main reasons of a floor covering destruction. In deciding on a polymeric covering it is necessary to consider the working temperature, probability of local increases and downturn of temperature of a floor.
6. ***Impenetrability for liquids***
   Protection of an environment demands impenetrability of floor covering to action of aggressive media washing-up liquids, vapor, etc. It is especially important for the floors exposed to liquids.
7. ***Crack resistance***
   Crack resistance of a floor covering increases its service life. Crack resistance is necessary for coverings in industrial refrigerators, open parking places, entrance stages etc. Ability of a polymeric floor covering to overlap cracks considerably raises impact resistance of a covering.
8. ***Resistance to sliding***
   Resistance to sliding is a traffic safety of pedestrians and transport. A floor covering should satisfy this requirement both in dry and in a damp condition**.**
9. ***Fire safety***
   Modern floor coverings should prevent distribution of a flame in case of a fire. It is especially important for the floors in a zone of evacuation: lobbies, staircases and elevators halls, general corridors, foyer etc.
10. ***Effective sound absorption***
    Good sound proofing and sound absorption of floor coverings are very important requirements at construction, reconstruction and repair of buildings.
11. ***UV radiation resistance***
    This requirement is important for spaces with the big glazing and for open-air surfaces. The floor should not fade on the sun and change its operational properties under influence of a UV radiation
12. ***Antistatic, current-carrying or dielectric properties***
    In premises with sensitive electronic equipment, in « pure rooms » of pharmaceutical plants, in spaces with high probability of formation of explosive dust concentration in air a floor covering shouldn't accumulate static electricity charges.
13. ***Attractive appearance and color palette***
    Competently selected color gamut exerts positive influence on the person, its physical condition, mood, labor productivity. Color is used for separation of various working zones from each other
14. ***Easiness of cleaning and service***
    Floor coverings should prevent from pollution penetration; thus general expenses for cleaning and service of premises will be reduced.
15. ***Fast putting into operation***
    The easy of floor covering structure, small laboriousness and short work cycle allow to put new buildings into service quickly**,** reduce time of reconstruction or repair. Fast repair is a controlling consideration of a continuity of technological processes.
16. ***Placement of a floor on freshly-placed or damp concrete***
    As a rule placement of a covering on the concrete basis is made later 28 days after the concrete works termination. Now there are polymeric floor coverings, allowing placement in 3-5 day after concrete laying.
17. ***Hygienic properties of coverings***

Pharmaceutical, cosmetic, food, chemical, electronic industry make high demands of hygiene. These branches an industry require « pure premises » where floors should be absolute dust out and easily be cleaned.

Covering floors from polymeric material satisfy to these requirements

From the big variety of the polymeric materials applied for flooring, polyurethane coverings take a special place. Polyurethane floors have important advantages over all known coverings (concrete, linoleum, tile etc.) on a lot of parameters. Monolithic coverings on the polyurethane basis have high mechanical strength at compression and tension, wear resistance. They are elastic, have high chemical stability to aggressive environments action including acids, alkalis, solvents, oils etc During operation a floor covering on polyurethane basis endures high differences of temperatures and greater impact loadings.

The fields of application of monolithic floor coverings are quite extensive and highly diversified. These are industrial workshops and adjoining platforms, garage complexes and multi-storey parking, car-care centers and car washes, warehouse and shopping centers, industrial refrigerators and freezing chambers, sports constructions, corridors, staircases etc.