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MESSAGE FROM NEIL B. GODICK

Most well educated and wealthy Russians would like to emigrate, a poll conducted by SuperJob.ru, an online research center reported. Seventy-three percent of respondents said that, given the opportunity, they would prefer to live in a foreign country. But the number of people actually planning to move abroad is much smaller: only 18 percent of respondents said they have applied for long-term visas or put together emigration documents.

Most respondents said they would take a job offer from a foreign employer if the proposed salary was higher than at home. But the youngest respondents said they would like to work abroad irrespective of the income to get new experience and learn a foreign language.

The typical reasons cited by those wanting to live and work abroad were included: "good workers are valued more abroad than in Russia," "I want to live in a country where people are protected by the law," and "Russia is a wonderful country, but in an awful state."

The poll revealed another trend: the more money people earn, the more they tend to look for opportunities to live and work abroad. The desire to emigrate also depends on the age of the respondent: professionals aged 20 to 40 are most interested in leaving Russia.

Why aren't the most educated and well-off Russians happy living and working at home? "From my point of view this is related to politics. Modern Russian authorities have not created favorable conditions for the establishment of talented people's careers in the country," said Danil Smirnov, the head of EduAbroad.ru. "Rampant corruption and incompetence in the country make it difficult to get worthy returns on investments in education and career development. Most graduates of even leading Russian universities can't find good jobs that fit their qualification without friends in the right places."

We do not intend for these reports to solve any need our readers may have. We do intend to keep everyone current on technology developments in Russia. If you would like any additional information on any of the developments reported – send us a note.

Nanomodifier used in
cylpebs production

Pashiysky cement-and-metallurgy works (PMTsZ, Perm oblast, www.speccement.ru) developed a unique nanomodifier in

cylindrical grinding media for ball mills (cylpebs) production. Products with increased quality are produced using this additive.



The technology was developed in 2008. After preliminary testing, it was introduced into production. Researchers from the Chair of Metal Physics and Heat Treatment, Ural Federal University confirmed that it was a quality breakthrough. In their opinion, this nanomodifier makes cylpebs stronger. A second advantage is the nanomodified cylpebs' higher cooling rate. Nanomodified cylpebs are supplied to ore mining and processing enterprises connected with OAO Norilsky Nickel, OAO Uralskaya Gorno-Obogatitelnaya Kompania, and other companies.

#2010-09-113

Heat shields

A Russian company specializing in fire-fighting equipment has received an order to produce heat shields invented by **Uzbek scientist Mirdzhalil Usmanov**.



OOO Spetsmontazh won an RF Emergency Situations Ministry tender for producing this firefighting equipment. The shield, a construction with a special cooling liquid stream, reduces heat flux intensity 100 and more times. The heat shield proved to be especially effective at extinguishing oil gusher, gas blowout and, gasoline filling station fires. Firefighters equipped with these screens can now get close to the raging flame to extinguish them. Protected by the shield, a firefighter can even walk through the combustion front. This enables an efficient, zero-loss foam and water spray application. Using the Usmanov shields, the time required for extinguishing a fire is reduced several times, and water consumptions falls by 80%. Usmanov's invention has been patented in Russia (patents RU 2156628, 2182025) and 16 other countries including Canada, Germany, France, Italy, Britain, and China. The Uzbek shields have passed fire tests at the All-Russia Institute of Fire Protection. An Uzbek R&D lab will continue developing new models. Currently, there are four models, each able to reduce the heat flux intensity 50 to 100 times.

#2010-09-114

New methods for
plexiglass
"nanopolishing"

F.V. Lukin Institute of Physical Problems (Zelenograd, www.niifp.ru) has developed and tested methods for smoothing PMMA surface roughness in the nanometric and subnanometric ranges.



Polymethyl metacrylate (PMMA) (better known as plexiglass) is used in electronics, micro and electromechanical systems, and in transplants. For these applications and others it is important to be able to modify PMMA surfaces. With this process PMMA surfaces can be modified so their parameters absolutely conform to specific application requirements. A critical surface parameter is its roughness. The polishing methodology is based on vacuum UV irradiation (wavelength: approximately 124 nm). As samples are irradiated, the incident photon energy is sufficiently high to break intermolecular bond within the polymer. Moreover, UV action causes chemical reactions stimulated by light quanta (photolysis). Polymer molecule fragments, along with volatile photolysis products, are continuously removed from the working chamber by a vacuum pump. The combined processes that arise during UV-polymer interaction results in smoothing nanometric surface roughness.

#2010-09-115

Nanodishware with
silver ions

TZK Tekhosnastka Company (Moscow, www.texosn.ru) produces dishware with antibacterial effectiveness. The antibacterial effectiveness is achieved by introducing silver nanoparticles into the dishware material. These particles create a self-cleaning protective film on the plastic's surface. The film suppresses the growth of most harmful bacteria and fungi.



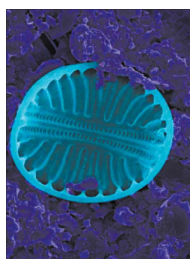
The technology is an outgrowth from a study of silver properties and its ions' interaction mechanism with bacterial microflora. From this study it was learned that merely introducing nanoparticles into the material cannot produce the desired effect. The technology calls for using a special spongy carrier. After a molecular level treatment it is introduced into the plastic and acts throughout the dishware's service life. All OOO TZK Tekhosnastka products undergo compulsory verification and certification at special Russian State (*Rostest*)

laboratories. The company's dishware can be used with children's foods.

#2010-09-116

Sorbents from diatomic algae

To obtain sorbents able to release high-purity agents, siliceous valves from living diatomic algae can be used. This was proven by researchers from the **Limnology Institute, RAS (Siberian Branch) (Irkutsk, www.lin.irk.ru)**. The findings open up new prospects for using diatoms – a renewable natural resource.



The method typically used for purification is HPLC. It requires using porous sorbents based on homogeneous siliceous particles sized 2 to 20 micrometers. The sorbent used must be strong enough to withstand high pressure. There is a natural source for homogeneously shaped and sized siliceous particles. These are the unicellular diatoms algae encased in their siliceous shells. The shell valve size varies from 2 to 2,000 μm . Their shape is species-specific, but they are always porous (they have tiny holes arranged in a strict order). For experiments, the researchers used *Synedra acus* species algae. Their valves are needle-shaped or rectangular and slightly concave. Their length is 50-100 or 20-30 μm respectively, width 2-5 μm , thickness about 200 nm. Algae grown in a photobioreactor were cleared from organics and flat sorbent plates were shaped from their porous valves. Preliminary tests showed that the sorbent's properties were equal to or exceeded existing commercial products.

#2010-09-117

"Electronic nose" that can recognize ten odors

Teachers and undergraduates from the **Chair of Physics and Nanotechnologies, Bashkirian State Pedagogical University (Ufa, www.bspu.ru)** have developed a device that can recognize smells and analyze substances contained in air and aqueous media.



The device is based on supersensitive polymer sensors that react to any changes in the atmosphere. The sensor is a thin film, which is 10,000 times thinner than a human hair. Currently the electronic nose

can identify about ten odors. It can easily determine the oxygen level in the air (e.g. at exhalation), various gases in the air, acids, and alkalis. The device could be widely used as a gas analyzer in coal mines or police/customs scanner for detecting explosives and narcotics. The research group is now preparing documents for a patent application.

#2010-09-118

Silverol® - a unique preparation based coordination metal compounds

Researchers from **FiBrMed science-and-production company (Tomsk, www.fibr.ru)** have developed Silverol®. This is a unique preparation based coordination metal compounds (silver, platinum, etc., salts).



The preparation has a comprehensive antibacterial, virucidal, immunomodulating action, and elevated therapeutic effect (cytostatic, antibacterial, virucidal). During its development, a difficult problem was solved – the components' activity synergy. Efficient transportants (means for carrying the active component to tumor cells) were identified. Silverol® ensures effective treatment for viral and bacterial diseases even when the pathogenic bacteria are resistant to ordinary antibiotics. Experiments on sick animals and hematological analysis to control the leukocyte and lymphocyte levels unambiguously confirmed positive dynamics after administering the Silverol® preparation. The preparation is a transparent liquid without specific odor or color. It should be kept in a place protected from light at 4°C. Currently it is being tested for treatment and prophylaxis for chlamydiosis, TB, viral leucosis in cattle, and other viral and bacterial diseases. A Russian patent (RU 2319491) was obtained. There are plans to obtain patents for the preparation in 5-6 countries, enter the international pharmaceutical market, and sell Russian and foreign licenses.

#2010-09-119