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IN THIS ISSUE:

MESSAGE FROM NEIL B. GODICK

More on the Russian economy. In 2008, Russia's economy is an unbridled success. Only a overheating by inflation or a catastrophic fall in oil prices will dampen, not interrupt, this Russian success. Former President Putin announced his economic goal in 2000 – grow the economy so it doubles by 2010. A goal that many laughed at has already been achieved. The Russians have taken some of their success and invested for the future.

Infrastructure improvements are a priority in Russia. Spending on power generation, highway construction, airport and railroad expansion, and upgrades are at historic levels. Take these improvements, add to it making the Sochi Olympics, a showpiece for the *new Russia* and there is a boom going on in Russia.

Russia has a unique approach to all of this – while seeking foreign investment in some of these projects they are passing legislation requiring control of these and other key economic sectors. The result of these infrastructure improvements will be that Russia will improve itself and have a legacy of new industries to supply its traditional trading partners.

Another legacy that will come from the current economic boom is the settlement of what has been a persistent Russian problem – a housing shortage. All over Russia, home construction and mortgage banking (previously unknown to Russia) are also booming. Foreign construction firms and bankers launched the building sector. They have been superseded by locals. The result of the housing boom is a legacy of new industries in the supply and building sector.

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.

Materials Sciences – Carbon Materials

St. Petersburg scientists have developed a method to prepare nanoporous carbon materials with predetermined properties and shapes. The application spectrum for these materials is very wide. Application methods, for example, include: as sorbents in water treatment to remove harmful materials, in electrodes of supercapacitors, cold emitters, membrane elements, and catalyst

supports. While developing the production method, the scientists used both known approaches and their own "know-how". In the course of their work, the scientists discovered which parameters in each of the process stage affected the product. Then the scientists learned how to control the process to obtain a final product with the sought after necessary properties. The controllable properties are: porosity, pore size and distribution, specific surface and strength. To develop their technology the scientists had to develop new methods for X-ray crystallography to determine the parameters of the resultant nano-structures. Finally, the scientists managed to develop technology that enabled them to obtain nanoporous carbon materials with predetermined properties and shape – tablets, membranes, tubes, powders, etc. The scientists have already tested the potential of selected nanoporous carbon products. For example, they found that nanoporous carbon absorbs mixtures of asymmetrical dimethylhydrazines, an extremely toxic rocket fuel, from water. The toxicant is sorbed in the pores of nanoporous carbon. By passing polluted water through them two or three times, it is possible to purify the water at least down to the maximum permissible concentration level. With respect to supercapacitors, their key part is a nanoporous carbon electrode with a highly developed surface.

Welding-Nanoparticles

At the Institute of Theoretical and Applied Mechanics, RAS (Siberian Branch) scientists have developed a method for laser welding aircraft materials using nanoparticles. This method considerably increases the strength of welded seams. This technology obviates the use of rivets in manufacturing an aircraft's body making the body both stronger and considerably lighter.

Health Sciences - Biochip diagnostics

Institute of Molecular Biology, RAS, scientists have applied for certification of their biochips that identify varieties of the hepatitis C virus. These scientists have achieved a breakthrough. In the past, using traditional methods, it is not always possible to establish the type of the C virus. Accurate diagnosis of the strain of the hepatitis C virus is very important as the disease is distinguished by its high variability. The different subtypes of the hepatitis C virus require specific treatment, including selection of drugs and their dosage. With the new biochips, which produce almost 100 efficiency, not only is the hepatitis C variety identified there is a prediction of the gravity of the disease and prescribe appropriate therapy.

Eye Care

Scientists from the Kemerovo State Medical Academy together with chemical engineers from *Tokem* (a factory) have developed an extremely effective means for treating chemical burns of the eye. The treatment is achieved by using small plates resembling a contact lens. Within the plates' matrix particles of so-called ion-exchange resin are distributed. By placing one of these plates under the lower eyelid, the acid or alkali that has gotten into the eye is quickly and effectively removed. The treatment prevents or reduces to a minimum any toxic effect of the chemicals on the tender eye tissues.

Oil and Gas Recovery

Siberian scientists have developed a new method to utilize natural gas emitted during the deposits' development. The scientists' use advanced nanotechnology to reprocess gas. The installation consists of a universal reactor, ultra-high frequency plasmatron that produces carbon, and a special membrane trap to catch particles. The method makes it possible to use casing-head gas and prevent it from escaping to the atmosphere. The method produces carbon with a high content of nano-particles and pure hydrogen. These products can be used as raw materials in the chemical industry to make strong and wear-resistant coatings.

Construction Materials

Researchers at the Research Institute of Building Materials of Tomsk State University of Architecture and Building have developed a new, environmentally-friendly building material than is manufactured entirely from fly ash, a waste product of coal-fired power plants. This unique construction material will reduce construction costs. Flash bricks are two times stronger and lighter than comparable clay bricks; this results in lightweight yet sturdy concrete. The thermal conductivity is also four times less than clay bricks. A Moscow-based company commissioned a fly ash processing factory. Flash bricks are one of the latest developments of the Tomsk Institute. Environmentally conscious researchers attach great importance to developing eco-friendly technology and materials. Dozens of their products have already been implemented in road construction and renovation projects both in Russia and internationally