



**The Materials Research Society (MRS)
Symposium Proceedings
„Synthesis, Characterization and Properties
of Energetic/Reactive Nanomaterials”**

The Materials Research Society (MRS) symposium proceedings „Synthesis, Characterization and Properties of Energetic/Reactive Nanomaterials”, Volume 800, presents papers given during the third symposium in the series of MRS symposia devoted to energetic materials. The proceedings refers to an almost complete scope of nanotechnology in the area of energetic/reactive materials. From one side, descriptions are given of the theories and modelling; from another – synthesis, characterization, applications and handling (both, in sensitivity and in environmental pollution, meanings).

Presented papers come from leading research centers, mainly but not only in the USA. There are also some papers from Canada, China, France, the Netherlands, South Korea and United Kingdom. Besides detailed description of laboratory facilities, some authors present achievements and recent interests of their laboratories or organizations. This is also very necessary knowledge because of past difficulties in scientific information exchange in this field. Moreover, the lack of papers from so called “post-communist” countries indicates great possibilities for cooperation in the future, especially as far as additional MRS symposia will hopefully take into consideration. The immediately next MRS Symposium H: “Multifunctional Energetic Materials” is scheduled for Nov/Dec, 2005, in Boston, MA.

In MRS Volume 800, results of very sophisticated research methods are presented. Introductions to the papers present the problems in detail. In connection with that, there are a large number of references. Another significant advantage of the proceedings is that, there are described not only properties of final products or methods, but also examples of differences between “classical” and monomolecular explosives. It is shown in the field of deflagration-to-detonation transition, kinetic and thermodynamic properties, energy density, burning rate, etc.

Up to now the analysis of achievements of nanotechnology assure that development of methods of manufacturing and use of nanometric dimensions

materials is a very important factor in multiple fields of all technologies of the XXI century. The topic is one of the most important in contemporary applied and theoretical science.

Among the materials covered, there are a few main groups: metals (aluminum, nickel, titanium and intermetallic compounds, alloys or multilayer foils); metal oxides (oxides of aluminum, iron, molybdenum) and other metal-containing compounds (perovskites, titanium-carbide and clusters of $\text{Al}(\text{MnO}_4)_x$ or $\text{Al}_x\text{Li}_y\text{O}_z$). There is information about the application in explosives technology of carbon structures (fullerenes, nanotubes) as well as information about other properties of these structures. Great emphasis is put on systems consisting of metal nanopowders and oxidizers (Metastable Intermolecular Composites, MICs). The majority of them are prospective ingredients of explosives, propellants or pyrotechnic compositions. However, these same ingredients are also useful for other applications, such as microelectronics, decontamination of surfaces from e.g. bacteria or toxic chemicals, e. g. volatile organic compounds (VOCs), orthopedic implants, ceramic membranes, heat exchanger and damping systems, micro- and macro-filters, coatings for gas turbines for stationary power generation, or even for synthesis of high density polyethylene by the Ziegler-Natta process.

The review of Volume 800 leads us to the conclusion, that not only specialists on explosive matters can find very valuable information in the MRS proceedings, but also other scientists will do so too. In our opinion, the readers of Central European Journal on Energetic Materials are especially interested in these problems where an expected increase of properties can be obtained by changing the size of the grains or particles of the materials used. This is why we have devoted our interest towards:

- additives to hydroxy-terminated polybutadiene (HTPB);
- gun propellants;
- explosives, e. g.: plastic-bonded explosives (PBXs), TNT, HNF, FOX-7, RDX, HMX, CL-20;
- pyrotechnic nanocompositions (thermites);
- nanoparticles produced by detonation;
- electric matches and gun primers.

These and other problems are also of interest for the long term research activity and applications.

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