

The Role of Performance Materials in a Federal Materials Initiative

Mary L. Good

Under the rubric of "competitiveness" and "global markets," policymakers in the United States have begun to debate what the nation should do to support our industrial base, protect our workforce, and maintain our standard of living. The concept of the creation and execution of a national "industrial policy" is not attractive in the context of free markets, industrial competition, and limited government interference in private enterprise. However, there is a building consensus that our long-term commitment to federally funded basic research should include the support of generic technologies which will be the basis of competitive products in the years ahead.

This momentum has resulted in a series of assessments of "critical technologies," first from the Department of Defense, then from the Department of Commerce, and now from the Office of Science and Technology Policy (OSTP) in the form of the Critical Technologies Report. These reports all attempt to assess emerging and underlying technologies which will be the drivers in the next generation of products and services. They also try to benchmark the United States' position in these technologies vis-a-vis our international competitors, particularly in Europe and Japan.

The reports have many things in common, but one persistent theme stands out. In every case, materials technology, partic-

ularly that related to advanced performance materials, is highlighted as a critical fundamental area where advancements will control future developments. The critical materials technologies include metals,

The enabling technology in many high tech products is a performance material.

ceramics, polymers, composites, and electronics, superconducting, magnetic, optical, and biological materials. In what can be considered as a first step toward a national technology policy, this awareness of the importance of materials technology has encouraged a "federal materials initiative." D. Allan Bromley, in his role as chair of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET), has initiated a Steering Group on Materials under the Committee on Industry and Technology. Their charter is to maximize the value of federal programs in materials, to identify policy issues, and to provide a data base on federal materials programs.

The intent is to monitor programs from basic research to development, improve materials standards, improve technology transfer to the private sector, and encourage government-industry-university partnerships in materials research and development. Particular emphasis will be placed on materials synthesis and processing, and a new NSF initiative will be funded for fiscal year 1992.

I believe this national emphasis is timely and well positioned to enhance our potential for international competitiveness. As we look at the high tech products (and the not so high tech) today, the enabling technology in many of them is a performance material. Improved efficiency and pollution control in aircraft and automotive engines require new thermally stable, durable materials to allow high temperature operations. Next-generation electronic substrates require materials capable of nanometer processing. If high-temperature superconductors are to fulfill their promise, new processing technologies must be found to allow for high currents in bulk materials. Many other such examples abound.

However, for these initiatives to succeed, the scientific and engineering communities in government, universities, and industry must respond. We *must* find ways to produce these materials in an economically competitive manner. We *must* couple the basic research output to innovation for new products. We capture the value of the materials research as rapidly as possible and reduce the cycle time between a research finding and a commercial offering. The burden is on the technical community to work together to make that happen. The government is taking the risk to sponsor the research—we must accept the responsibility to make it valuable in our open, free market system.

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The *MRS Bulletin* welcomes your response or opinion on federal materials initiatives, materials science legislation, and other issues of interest to the materials science community.

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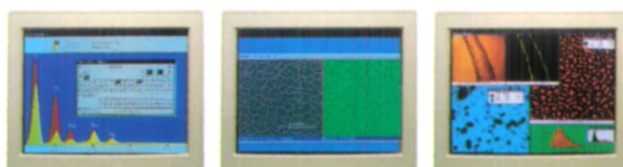
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