THE
NATIONAL LAW REVIEW

First-Of-Its-Kind Search Engine Will Speed Materials Research

Article By
U.S. Department of Energy
U.S. Department of Energy

- Public Education & Services
- Environmental, Energy & Resources
- Communications, Media & Internet
- Administrative & Regulatory

- All Federal

Thursday, November 3, 2011

Washington, D.C. – Researchers from the Department of Energy's (DOE's) Lawrence Berkeley National Laboratory (Berkeley Lab) and the Massachusetts Institute of Technology (MIT) jointly launched today a groundbreaking new online tool called the Materials Project, which operates like a "Google" of material properties, enabling scientists and engineers from universities, national laboratories and private industry to accelerate the development of new materials, including critical materials.

"By accelerating the development of new materials, we can drive discoveries that not only help power clean energy, but also are used in common consumer products." said Secretary of Energy Steven Chu. "This research tool will help the United States compete with other developers of new materials, and could potentially create new domestic industries."

Discovering new materials and strengthening the properties of existing materials are key to improving just about everything humans use – from buildings and highways to modern necessities. For example, advances in a group of materials called "critical materials" are more important to America's competitiveness than ever before – particularly in the clean energy field. Cell phones, wind turbines, solar panels and a variety of military technologies depend on these roughly fourteen elements (including nine "rare earth" elements). With about 90 percent coming from China, there are growing concerns about potential supply shortages and disruptions.

With the Materials Project, researchers can use supercomputers to characterize properties of inorganic compounds, including their stability, voltage, capacity, and oxidation state, which had previously not been possible. The results are then organized into a database that gives all researchers at DOE's national labs free access. This database already contains the properties of more than 15,000 inorganic compounds, and hundreds of more compounds are added every day.

Already, scientists are using the tool to work with several companies interested in making stronger, corrosion-resistant lightweight aluminum alloys, which could make it possible to produce lighter weight vehicles and airplanes. Scientists have also already successfully applied this tool for prediction and discovery of materials used for clean energy technologies, including lithium ion batteries, hydrogen storage, thermoelectrics, electrodes for fuel cells, and photovoltaics.

DOE's Office of Science is the single largest supporter of basic research in the physical sciences in the United States, and is working to address some of the most pressing challenges of our time. For more information please visit http://science.energy.gov.