(dollars in thousands)

FY 2004	FY 2005	FY 2006

- **Materials Chemistry**..... **40,338** **45,422** **41,740**

  This activity supports basic research on the design, synthesis, characterization, and properties of novel materials and structures. The portfolio emphasizes solid-state chemistry, surface chemistry, and interfacial chemistry. It includes investigation of novel materials such as low-dimensional solids, self-assembled monolayers, cluster and nanocrystal-based materials, conducting and electroluminescent polymers, organic superconductors and magnets, complex fluids, hybrid materials, biomolecular materials and solid-state neutron detectors. There is a continued interest in the synthesis of new complex materials with nanoscale structural control and unique material properties that originate at the nanoscale. Significant research opportunities also exist at the biology/materials science interface. A wide variety of experimental techniques are employed to characterize these materials including x-ray photoemission and other spectroscopies, scanning tunneling and atomic force microscopies, nuclear magnetic resonance (NMR), and x-ray and neutron reflectometry. The program also supports the development of new experimental techniques such as surface force apparatus in combination with various spectroscopies.

  The research in this activity underpins many energy-related technological areas such as batteries and fuel cells, catalysis, friction and lubrication, membranes, sensors and electronics, and materials aspects of environmental chemistry. The development of synthetic membranes using biological approaches may yield materials for advanced separations and energy storage.

  Capital equipment is provided for such items as advanced nuclear magnetic resonance and magnetic resonance imaging instrumentation and novel atomic force microscopes.

  In FY 2006, funding will continue to explore multi-disciplinary approaches (with biology, chemistry, physics and computational science playing major roles) to model, design and synthesize new and novel materials. Also of interest is the development of new organic electronic materials with novel magnetic, conducting, and optical properties; single crystal growth of advanced materials that will lead to better characterization, and consequently, better understanding of their properties; and polymer interfaces. The overall decrease for materials chemistry is attributable to an increase for research related to basic research for hydrogen production, storage, and use ($+500,000) and a decrease due to FY 2005 one-time increments in areas of nanoscale polymer materials research, and improvements to existing instruments, including nuclear magnetic resonance and novel atomic force microscopes, and a reduction for smaller group activities ($-4,182,000), including single investigator projects at DOE national laboratories.

- **Experimental Program to Stimulate Competitive Research (EPSCoR)**..... **7,673** **7,643** **7,280**

  This activity supports basic research spanning the complete range of activities within the Department in states that have historically received relatively less Federal research funding. The EPSCoR states are Alabama, Alaska, Arkansas, Delaware, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, West Virginia, Wyoming, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands. The work supported by the EPSCoR program includes research in materials sciences, chemical sciences, biological and environmental sciences, high energy

(dollars in thousands)

FY 2004	FY 2005	FY 2006

and nuclear physics, fusion energy sciences, fossil energy sciences, and energy efficiency and renewable energy sciences. The following table shows EPSCoR distribution of funds by state. The decrease in EPSCoR is attributable to a reduction in new competitions in FY 2006 ($-363,000).

EPSCoR Distribution of Funds by State

(dollars in thousands)

	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate
Alabama	987	510	600
Alaska	0	0	0
Arkansas	140	0	135
Delaware[a]	0	0	0
Hawaii[b]	0	0	0
Idaho	328	102	375
Kansas	527	560	135
Kentucky	247	224	0
Louisiana	647	198	462
Maine	0	0	0
Mississippi	578	535	132
Montana	515	375	375
Nebraska	0	0	125
Nevada	0	0	0
New Mexico[b]	135	0	135
North Dakota	410	139	273
Oklahoma	525	135	350
Puerto Rico	375	375	375
South Carolina	854	266	535
South Dakota	125	0	125
Tennessee[a]	0	0	0
Vermont	877	709	0
US Virgin Islands[a]	0	0	0
West Virginia	248	201	90
Wyoming	130	130	140
Technical Support	25	110	110
Other[c]	0	3,074	2,808
Total	7,673	7,643	7,280

[a] Delaware, Tennessee, and U.S. Virgin Islands became eligible for funding in FY 2004.
[b] Hawaii and New Mexcio became eligible for funding in FY 2002.
[c] Uncommitted funds in FY2005 and FY2006 will be competed among all EPSCoR states.