Designing New Materials for Tomorrow's Clean Energy Technologies

Ryan O'Hayre
Professor, Metallurgical and Materials Engineering

CURRENT RESEARCH

Using abundant elements to create sustainable energy sources for our future

More than 85% of the world's current energy needs are met through fossil fuels such as coal, oil, and natural gas. Therefore, the demand for sustainable energy sources is a necessity for our future. Dr. Ryan O'Hayre, professor at the Colorado School of Mines, has a vision to create tomorrow's clean energy technologies for a greener planet. His research centers around energy materials, emphasizing aspects of electronic and ionic oxides, catalysis, fuel cells, and electrochemistry. Dr. O'Hayre's philosophy of using the most abundant and affordable materials allows him to create innovative and more efficient technologies that will one day provide a cleaner source of energy.

The utilization of elements that are naturally more abundant and therefore less expensive, allows new energy materials to one day impact households nationally as his technologies will replace technologies currently used. In addition, once commercialized, his innovative research will have sweeping applications including more efficient power, transportation, and heating. This unique approach to energy technologies makes Dr. O'Hayre's research critical in sustainable development and will create a world that is healthier, cleaner, and more sustainable for generations to come.

Current research topics in Dr. O'Hayre's lab include:

- Making cheaper catalysts: Many existing catalysts are based on platinum which is a very costly material. In a project sponsored by the Army Research Office, Dr. O'Hayre found that mixing carbon and nitrogen, two of the cheapest and most abundant elements in the universe, with platinum, allows platinum to become more efficient. Therefore, he is researching what is the best combination of...

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AFFILIATION

Colorado School of Mines

EDUCATION

- B.S. in Metallurgical and Materials Engineering 1999 ,Colorado School of Mines
- M.S. in Materials Science and Engineering 2001, Stanford University
- Ph.D. in Materials Science and Engineering 2004 ,Stanford University

AWARDS

- Presidential Early Career Award for Science and Engineering, 2009
- Outstanding Faculty Award, 2009
- Army Young Investigator Award, DoD ARO, 2007
- International Postdoctoral Research Fellowship, 2005-2006
- Pan-American Advanced Studies Institute Fellow, 2003

RESEARCH AREAS

Environment, Clean Energy, Clean Energy, Space

FUNDING REQUEST

Your contributions will support Dr. O'Hayre as he continues to study energy materials and the ways we can have a cleaner planet powered by inexpensive, abundant, and environmentally friendly sources of energy. Your funding will help with the 700 thousand to 1 million dollars in funding necessary each year to keep his lab running with highly trained staff, student workers, equipment, consumables, and overhead costs.