JEFFREY S. BECK

1962–2012

Elected in 2011

"For discovery and commercialization of selective, environmentally beneficial catalytic routes to major petrochemicals and for leadership in industrial engineering."

BY JOSÉ G. SANTIESTEBAN AND MICHAEL P. RAMAGE

JEFFREY SCOTT ("Jeff") BECK, recognized as an outstanding industrial researcher and leader who made seminal contributions to both industrial and academic scientific communities, passed away on April 7, 2012, in Houston, Texas, with his wife, family, and close friends at his side.

Born on October 23, 1962, in Brooklyn, New York, to Irwin and Leila Beck, Jeff grew up in Queens, NY. From a very early age, he was a "ball of fire" who displayed a dedication to science and discovery. He earned a BS degree in chemistry at State University of New York at Binghamton in 1984 and, true to his high school yearbook's prediction, a PhD in inorganic chemistry, from the University of Pennsylvania in 1989.

Jeff was blessed with an amazing combination of scientific, engineering, and business skills. He had a tremendous capacity to make breakthroughs at the forefront of science, the engineering skills to translate science into profit for the company, and the visionary leadership to manage a worldwide marketing organization. His career in ExxonMobil advanced rapidly, and he had significant potential to advance to senior management positions in the company.

Jeff's professional career began at Mobil's Central Research Laboratory, in Pennington, New Jersey, immediately after he received his PhD. He loved to be in the laboratory doing

the experiments himself, shoulder-to-shoulder with his technicians. In the first eight years of his professional career he made scientific and technical contributions that most researchers do not achieve in a lifetime.

His groundbreaking research on liquid crystal templating was key to the discovery of an entirely new class of tunable mesoporous materials, MCM-41S, with pore sizes in the range of 16 to 100 Å. For his part in the discovery of these materials, a major innovation in nanotechnology as well as in the fields of mesoporous and self-assembled materials, he received, together with collaborators Charles Kresge, James Vartuli, Wieslaw Roth, and Michael Leonowicz, the 1994 Donald W. Breck Award of the International Zeolite Association. His work spawned a new field of materials chemistry and has led to the discovery of hundreds of related materials with applications in catalysis, separation science, and nanotechnology.

Jeff coauthored two seminal articles describing the scientific basis that led to the discovery of mesoporous materials: "Ordered Mesoporous Molecular-Sieves Synthesized by a Liquid-Crystal Template Mechanism," *Nature,* 1992, 359(6397): 710–712; and "A New Family of Mesoporous Molecular-Sieves Prepared with Liquid-Crystal Templates," *Journal of the American Chemical Society*, 1992, 114(27): 10834–10843. The thousands of citations (>13,500, Science Citation Index) of these papers by academic and industrial scientists testify to the impact of this breakthrough discovery in the scientific community.

Many colleagues described Jeff as "a tireless leader of bridging emerging science and technology with practical applications." His research in "molecular engineering" of zeolites and the interplay between reaction pathways, kinetics, and mass transport in microporous materials led to several commercial processes for the selective production of paraxylene. His fundamental studies enabled him to tailor the diffusion properties of catalysts by using novel surface modification techniques. He also conducted detailed kinetic and mechanistic studies to establish the performance of catalysts during scale-up and commercialization efforts.

Some of the commercial technologies based on Jeff's work are PxMax™ (toluene to paraxylene) and XyMax™, which are considered landmark technical achievements and the world's most selective processes for production of paraxylene. They have been deployed worldwide in more than 20 units, with more planned, and have been recognized not just for their rather significant economic impact but also for their environmental benefits—in reducing the energy required to produce paraxylene—and their societal benefits—in enabling the lower-cost production of the key component used in the production of polyethyleneterephthelate (PET), one of the world's most widely used polymers. Jeff and his colleagues were recognized for their outstanding contributions with the 2003 Thomas Alva Edison Award of the New Jersey Research and Development Council, the American Chemical Society 2007 Heroes of Chemistry Award, and the North American Catalysis Society 2009 Eugene J. Houdry Award in Applied Catalysis.

Immediately after the merger of Exxon and Mobil in 2000, Jeff became director of catalyst technology and led efforts to merge the catalyst R&D technologies of the two companies to address refining and chemical products manufacturing needs. In 2004 he transferred to ExxonMobil Baytown Refinery in Texas and held the position of refinery technical manager. His leadership and communication skills were instrumental in improving both the synergies between refinery and chemicals plant and the profitability of the largest refinery in the United States.

Jeff talked vividly about his two-year assignment in the refinery and his respect for the commitment to excellence of engineers, chemists, and operators working in the manufacturing sites. He was proud of how well he worked with the refinery personnel during the preparation for Hurricane Rita and the subsequent disaster recovery efforts.

After two years in Texas, Jeff landed his dream job as manager of ExxonMobil's prestigious Corporate Strategic Research, in Annandale, New Jersey, where he directed the technical efforts of over 250 scientists, engineers, and

technicians in broad areas of energy and petrochemical science critical to the company's worldwide Downstream, Chemical, and Upstream businesses. He was instrumental in setting the direction of research programs on renewable energy and the reduction of carbon emissions.

His last assignment was as polyethylene global marketing manager at ExxonMobil Chemical Company in Houston, where he led strategic marketing projects and spearheaded efforts aimed at the sustainability of chemical products.

Jeff was well known worldwide for his contributions to catalysis and materials science. He was named as inventor or coinventor on more than 60 US patents, and authored or coauthored 46 refereed journal articles and 3 book chapters. He frequently delivered invited lectures at US and international universities and conferences. Among the numerous awards he received, he was particularly proud of his election to the National Academy of Engineering. He was among the youngest ever elected to the NAE.

In addition to being a creative and prolific scientist, an inspirational leader, and a renowned inventor and innovator in his field, Jeff was a passionate speaker and an engaging storyteller with a great sense of humor. And while he enjoyed the thrill of discovery and commercialization, he was also a wonderful negotiator who looked for the "win-win" in every deal. This was as true in his dealings with companies he collaborated with as in his approach to deals concerning his art and furniture collections.

Jeff was a devoted husband and friend. The loves of his life were his wife Lisa, his sister Shari, and his dogs Pharaoh and Monty. Though he was taken from this world too soon, his loved ones can take comfort in knowing that he lived his life fully and the way he wanted. He demanded excellence, did not tolerate mediocrity, and inspired all who were fortunate enough to know him. His family, friends, and colleagues will remember him as a remarkable individual. We feel blessed to have had him with us. Jeff is survived by his wife Lisa, parents Irwin and Leila, sister Shari, and brother Richard.