December 10, 2013

BP
Conversion Technology Center
Naperville, IL

Dear Hiring Manager:

I am writing in response to the advertised opening listed on the BP website, requisition ID # 50842BR. I currently work on a project sponsored by BP and supervised by Ph.D. John Shabaker, who recommended me to apply for this position. I am currently a doctoral candidate working with Dr. Robert J. Davis at the University of Virginia in the Department of Chemical Engineering and expect to receive my doctorate in June 2014.

My overarching goal is to develop renewable and biorenewable resources and technologies to move towards a more sustainable industry and society. Currently I do so with heterogeneous catalysis. I synthesize, test, and optimize catalysts and catalytic processes that convert biomass derived feedstock into biorenewable chemicals and fuels. My dissertation work comprises a study of deoxygenation of carboxylic acids over supported transition metals, a reaction very characteristic for low turnover frequencies and poor product selectivity towards the formation of olefins. Carefully designing a lab-scale reaction system and choosing the reaction conditions, which were a guided by DFT calculations performed by Dr. Matthew Neurock's lab at the University of Virginia, I was able to obtain olefins as the major product and develop a reaction mechanism, which I have tested and confirmed over three different metals and two different carboxylic acids. Furthermore, by combining several catalyst characterization techniques such as chemisorption, physisorption, x-ray diffraction, SEM, and TEM, I developed a characterization method to determine the causes for catalyst deactivation which, until today, were just speculations in the literature and many failed to address. With this work I discovered that one of the major reasons for low catalytic turnover is metal sintering, especially for Pd-based catalyst, and poisoning by product formation. In two ongoing collaborative works with the University of New Mexico, I designed a sintering resistant Pd-based catalyst and I am currently developing strategies to minimize the effect of catalyst deactivation and enhance catalyst activity by alloying Pd with other metals.

I am a creative, analytical person who is persistent, personable, cooperative, and driven by challenge. I will grow to meet any challenge, both professionally and personally. The several awards I have received throughout my career and the multiple collaborations I have led speak towards these aptitudes. As a researcher I come to the laboratory each day ready to grow with any challenge my research brings me. As a mentor I use engaging teaching methods and assignments to foster critical thinking and a collaborative environment. As a leader I listen, give advice, help, coordinate, and learn from my collaborators; I grow with my coworkers as I encourage their development and I get involved in safety committees to provide a safe working environment to my coworkers and department.

My goal is to be part of a culturally diverse, understanding group of professionals that finds innovative solutions to complex, global challenges in an atmosphere of trust, cooperation, and mutual respect. I am eager to travel and expand my worldview. If I can better understand different cultures and issues, I can better contribute to the global challenges that BP addresses.

In summary, I believe my expert knowledge in catalysis and reaction engineering coupled with my vast leadership, creativity, and my international background make me an ideal candidate for this position and an asset to BP.

I would be happy to provide you with any additional materials and welcome the opportunity to discuss this position.

Thank you for your consideration. I look forward to hearing from you soon.