Muhammad Saleem Najib

27 May 2020

Testimonial for my Internship at KIT

I am an engineering student at the University of Waterloo in Canada in the nanotechnology program. Starting in September 2019 to May 2020, for a total of nine months, I worked at the Institute of Nanotechnology (INT) at Karlsruhe Institute for Technology (KIT) as an intern on a scholarship funded by the Christian Bürkert Foundation. I was under the supervision of a PhD candidate, David Stenzel. I am very grateful for the Christian Bürkert Foundation for sponsoring my stay in Germany and for David Stenzel for supervising my work. My original stay was planned for a total of eight months however due to complications caused by the Covid-19 pandemic; I was unable to leave as initially planned but thankfully the Christian Bürkert Foundation was very understanding, and my sponsorship was successfully extended. I am also greatful for the International Office at KIT for helping find living accomodations in Karlsruhe as well as their welcoming altitude.

At INT, I was able to lead a research project on High Entropy Oxides (HEOs) and their potential application in lithium ion batteries. I learned to synthesize and test novel nanomaterials with exciting new properties. I learned how to analyze and obtain x-ray diffraction (XRD) patterns for these new materials as well as taking images of nanoparticles using a scanning electron microscope (SEM). My main research was aimed to reduce the temperature required to synthesize HEOs. In Figure 1, I included an SEM image of a doughnut-shaped nanoparticles that was able to obtain as an example. By the end of my nine months internship we had gathered very promising data and were in the process of writing a scientific paper for publication. I also contributed to the electrochemical testing of important samples for another paper published by Junbo Wang as the first author [1]. Currently, two other scientific papers are in the process of publications that I helped contribute to. Overall, I gained valuable hands-on lab experience, as well as writing scientific reports during my stay in Germany.

Not to mention, thanks to my internship in Germany, I was able experience many different European cultures for the first time in my life. My supervisor, David Stenzel ensured to introduce me to various types of traditional German festivals and cuisines. My internship also helped me explore other countries in Europe during the winter break, including France, Czechia, Austria, Switzerland, and the Netherlands. In figure 2, I included a picture of myself on my last trip outside in Europe in the Netherlands.

Based on my experience at KIT, I highly recommend other students at my university and other international students to consider KIT and the MINTernship program for their international internship. I gained valuable academic and international experience and thoroughly enjoyed my stay in Germany.

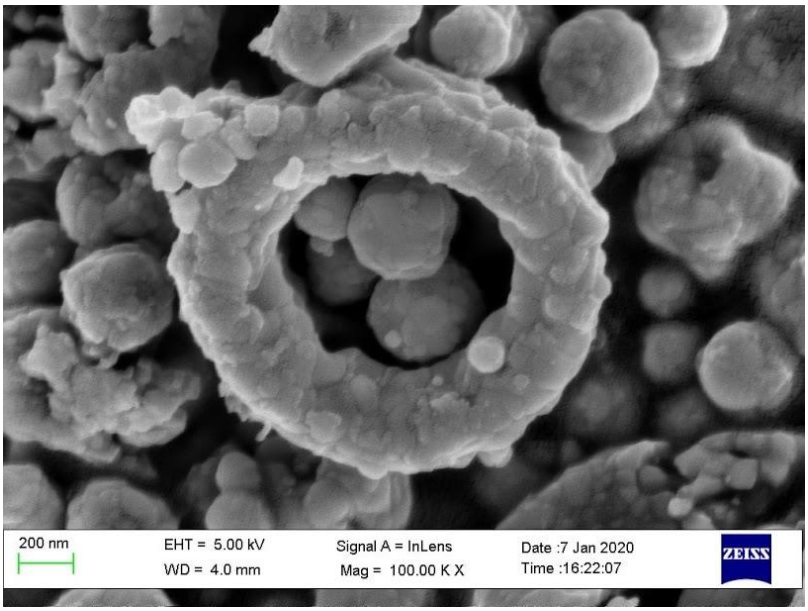

Figure 1: SEM image of a doughnut-shaped nanoparticle

Figure 2: A picture of myself in the Netherlands

[1] J. Wang *et al.*, "Spinel to Rock-Salt Transformation in High Entropy Oxides with Li Incorporation," *Electrochem*, vol. 1, no. 1, pp. 60–74, 2020.