Announcing the Final Examination of Baig Abdullah Al Muhit for the degree of Master of Science

Time & Location: July 6, 2015 at 11:00 AM in Engineering 2 211P
Title: Investigation on the mechanical, microstructural, and electrical properties of graphene oxide-cement composite

Mechanical properties of GO cement paste composite has been evaluated. Microstructural characterization techniques such as SEM, EDX and XRD are employed to investigate the underlying cause of the reported mechanical behavior. Mechanical properties of rGO cement composite are investigated and found out that rGO-cement paste show 27% higher flexural strength compared to cement paste. Heterogeneous nucleation is hypothesized to be responsible for high mechanical property exhibited by GO cement paste and proved by XRD. Early age hydration data provided for rGO cement paste showed precipitates along grain boundaries which dictates that heterogeneous nucleation was also responsible for hydration of rGO cement paste. rGO cement paste with 5% rGO content showed lowest electrical resistivity—a remarkable 93% decrease in resistivity compared to plain cement paste. rGO cement paste with 0.5% and 1% rGO content showed higher electrical resistivity compared to that of cement paste in both oven dry and saturated surface dry condition. The electrical resistivity shown by rGO cement composites are comparable to other fiber reinforced cement composite such as carbon fiber and steel fiber reinforced composites.

Major: Civil Engineering

Educational Career:
Bachelor's of Civil Engineering, BS, 2007, Bangladesh University of Engineering and Technology
Master's of Civil Engineering, MS, 2012, University of Malaya
Master's of Materials Science and Engineering, MS, 2015, University of Central Florida

Committee in Charge:
Dr. Boo Hyun Nam, Chair, Civil Engineering
Manoj Chopra, Civil Engineering
Lei Zhai, NanoScience Technology Center

Approved for distribution by Dr. Boo Hyun Nam, Committee Chair, on June 22, 2015.

The public is welcome to attend.