

## **SYNTHESIS OF MONODISPERSED IRON OXIDE PARTICLES IN A LARGE-SCALE MICROWAVE REACTOR**

Giann-Yang Hwang, Shangzhao Shi, Zhiyong Xu, Karl W. Peterson  
Michigan Technological University  
Houghton, MI 49931  
Email: [jhwang@mtu.edu](mailto:jhwang@mtu.edu)

Well defined, monodispersed iron oxide particles can be synthesized in conventional hydrolysis approaches, but the synthesis generally takes 2-7 days. Microwave hydrothermal approaches offer the possibility to significantly reduce the synthesis time. This work demonstrates the feasibility of microwave synthesis in large scale. The batch size was five liters, and the holding time was 2 hours. The crystallinity, the shape and size of the synthesized particles were comparable to those produced from conventional approaches. The only problem was a relatively long period for cooling down of the product solution. When this period can be eliminated or significantly shortened, a production facility with laboratory size but industrial productivity will be realized.