

Synthesis and Characterization of Nano-materials (ultra-thin Fe, FeS nano-sheets and single crystalline Fe nano-cubes) Via Mustard Oil Mediated Solution Phase Process and Their Applications in Sensing and Photo-Thermal ablation.

Ankur Baliyan, Yoshikata Nakajima, Takahiro Fukuda, Tatsuro Hanajiri and Toru Maekawa.

Bio-Nano Electronics Research Centre, Toyo University, 2100 Kujirai, Kawagoe, Saitama 350-8585, Japan.

Phone: +81-49 239 1375, Fax: +81-49 234 2502

ankurbaliyan@gmail.com

Abstract: We report a facile synthesis of ultra-thin Fe, FeS nano-sheets and single crystalline Fe nano-cubes using mustard oil. Nano-materials were studied in detailed and characterized by using HRTEM, HRSEM, EDS, SAED, XRD, AFM, U-Vis, FTIR, Raman, XPS, and Auger spectroscopy. We have also investigated the mechanism involved for the formation of such nano-structures. It is an inexpensive, efficient, convenient, and ultra fast process to synthesis varieties of nano-materials. In addition, their possible sensing and photo-thermal ablation ability have been highlighted.

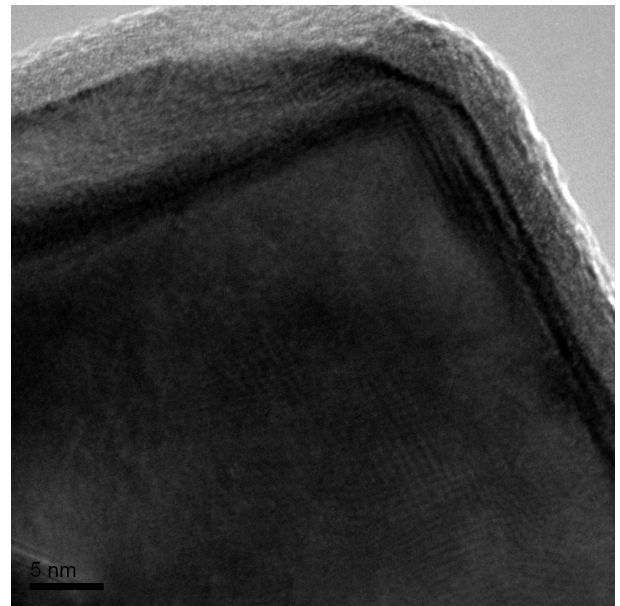
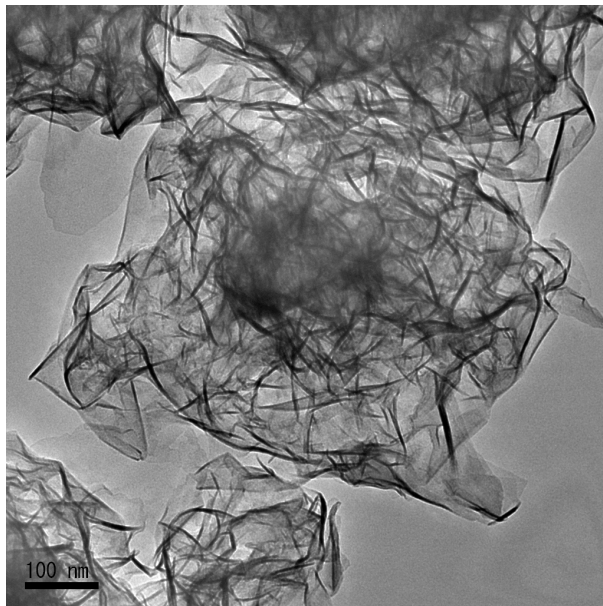


Figure 1: TEM image of ultra-thin Fe Nano-sheets

Figure 2: TEM image of Fe Nano-cube.

References:

[1] Y.Y. Xu, D. Zhao, W.T. Jin, P. Kashkarov and H. Zhang. *Physica E*, 41, 806, (2009).