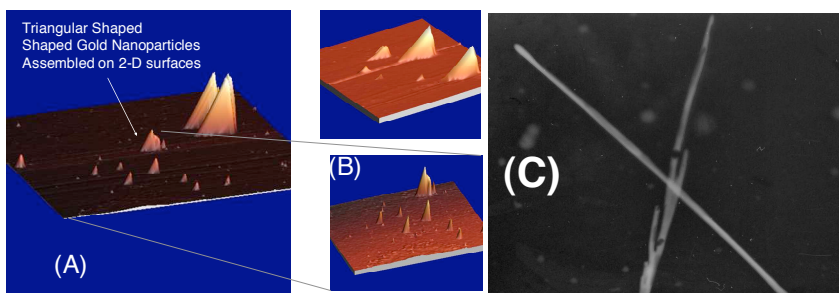


Chemistry 600 – Module II, Fall Semester, 2007
Materials Chemistry / Nanoscience and Nanotechnology
Module 2 (October 2 – Nov. 1)

Professor: Tewodros (Teddy) Asefa

Office: CST 1-048; Lab 2-050; Phone: 443-3360; E-mail: tasefa@syr.edu

Course Website: <http://syllabus.syr.edu/CHE/tasefa/che625/>



Asefa Group: Triangular-shaped Au Nanoparticles (AFM Image)

Cu nanowires extracted from the channels

Time: 11:00 am – 12:20 pm

Room: 1-020 CST

First class starts: Tuesday, October 2

Last Class: Friday, Nov. 1

Course Description/Learning Goals: Nanoscience and nanotechnology are among the most rapidly growing areas of science and technology today. New nanomaterials discovered each day and their unique properties and potential applications are expected to result in wide range of societal benefits in the future. This course offers basic fundamental knowledge and understanding and current research progresses on topics in materials chemistry, nanoscience, nanotechnology, and nanobiotechnology. Synthetic and characterizations methods used to various types of Inorganic based nanomaterials and their potential applications in areas such as catalysis, photovoltaics and medicine will be discussed.

Office Hours: Professor Asefa's office hour is on Tuesday, 3:00-4:00 pm or by appointment. His office is in Room 1-048 CST. You can also check him in his lab in Room 2-050.

Materials/Textbook: There is no specific text book for the course. However, I recommend you to read the following books and other books in the library that relate to nanomaterials synthesis and characterizations.

Nanochemistry: A Chemical Approach to Nanomaterials by Andre Arsenault and Geoffrey A. Ozin, RSC, 2005.

Nanoscale Materials in Chemistry by Kenneth J. Klabunde, Wiley Interscience, 2001.

Handouts on various current topics will also be given. It is also essential to read other reference and related materials from the literature.

Grading: The overall grade of the course depends on one written report on a recent research article in the literature (45%) and a research presentation on a research article and defending it (55%). The report will have to have no more than 1,500 words, without references and it has to be on an area of materials chemistry or nanoscience and nanotechnology from a recently published article on *J. Mater. Chem*; *J. Am. Chem. Soc.*; *Adv. Mater.*; *Nano Letters*; *Adv. Funct. Mater.*, etc. The students need to choose a topic by Oct. 15 and should submit a short abstract (less than 100 words) to Dr. Asefa about it via e-mail. He/she may also discuss with Dr. Asefa about their plans thereafter. Students will present their research presentation work and will defend it in 20 minutes. Students that fail to submit a proposal or failed to present are considered failed and will get an automatic F. No make-up writing assignments will be given to improve the grades.

Academic Integrity: Students writing proposals and other materials are needed to give due credits and references to any materials taken from anywhere, if they have used it for their write-up. Being lenient and not giving such due credits are considered serious breach of academic integrity and will be considered as plagiarism. They will cause zeros on the proposals and other serious consequences.

Exam Dates:

Final Presentation Date: Nov. 1, 2007, at 11:00 am in Room CST 1-020.

Proposal Due: October 25, 2007 during class

CHE 615, Section III Course Calendar (Subject to change)

Date	Topics	Recommended Materials
Oct. 2	Introduction: Inorganic Materials Chemistry and Nanochemistry Basics	
Oct. 4	Nanomaterials Synthesis Methods: Bottom-up vs. Top-down Methods	
Oct. 9	Sol-Gel Synthesis of Metal Oxides	
Oct. 11	Inorganic Materials synthesis by Templating and Self-Assembly	
Oct. 16	Nanostructured, Nanoporous, Mesostructured and Mesoporous Materials	
Oct. 18	Inorganic Nanoclusters and Nanowires, Metal, Metal Oxide, and Carbon Nanotubes	
Oct. 23	Colloidal Crystals and Opals	
Oct. 25	Layer by layer self-assembly and core-shell Inorganic Nanomaterials and 2-D Self-assembled Structures	

Nov. 24	Inorganic-Organic and Inorganic-Polymer Nanocomposite Materials	
Oct. 30	Biomimetics: Bioinspired Synthesis of Inorganic Nanobiomaterials; and Applications (Examples: Catalysis, Drug Delivery and Solar Cells)	
Nov. 1	Final Exam: Presentations	