Since their discovery in the 1950’s neutrinos have presented physicists with many challenges. Not only are neutrinos difficult to detect, but they also have behavior much different from their charged lepton partners. In 1969, it was proposed that neutrinos could oscillate and after many years and experiments the SNO and Super-Kamiokande collaborations presented strong evidence to support neutrino oscillations. Results from K2K (KEK to Kamioka) and MINOS have added to the evidence of neutrino oscillations. The T2K (Tokai to Kamioka) experiment in Japan will be the first of the 2nd generation “super-beam” experiments designed to measure the parameters of the MNS neutrino mixing matrix to high precision, specifically the angle $\theta_{13}$. I will discuss the ideas of neutrino oscillations, and describe the details of the T2K experiment, including plans for its installation, which will take place this summer. I will also present some of the ideas for long baseline neutrino experiments that may be built following the T2K run.

Congratulations To:

Dr. Roy Goodrich, Ball Family Professor Emeritus, for being awarded a 2009 Distinguished Alumni Award from Louisiana Tech University College of Engineering and Science.

Publications:


CHEM 7800 SEMINAR

Co-Sponsored by LSU’s HBCU Visiting Scholar Program in Physics & Astronomy

Location: 210 Choppin Hall

Date: Tuesday, February 10, 2009

Time: 12:10 pm – 1:pm

Title: Bimetallic Nanocatalysts for Water-Gas-Shift Reaction

Speaker: Dr. Naidu V. Seetala
Edward Bouchet Endowed Professor in Physics
Department of Physics
Grambling State University, Grambling, LA 71245
naidusv@gram.edu, 318-274-2574

Abstract: We have prepared bimetallic nanocatalysts supported in mesoporous Al₂O₃ granules for hydrogen production from the Water-Gas-Shift (WGS) reaction of CO and H₂O. The granular catalysts were analyzed by DTA/TGA, PXRD, and BET. Screening of the WGS catalysts and optimization of reaction temperatures were performed using a dynamic flow reactor. A gas-phase batch reactor was used to obtain kinetic data and the parameters for maximum CO conversion. Both reactors were connected to a Gas Chromatograph (GC) for product analysis.

Six Low Temperature Shift (LTS) catalysts with optimum temperature between 200-300 °C, and four High Temperature Shift (HTS) catalysts with optimum temperature between 350-400° C were examined for catalytic activities. Ni(10%)Ce(11%) catalyst was found to be the best WGS catalyst among the LTS catalysts, while Ni(5%)Cu(5%)Ce(11%) was found to be the best among HTS catalysts.

The Ce promoter had a significant effect on optimum reaction temperature and catalytic activity of the catalysts. Increasing the Ce composition has a favorable effect by increasing the catalytic activity and decreasing the optimum reaction temperature of the catalyst. Effect of Ni composition at constant Ce also was studied. Lower Ni compositions increased the WGS reaction activity.