Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Synthesis of carbon nano-structures using organic-molecule intercalated taeniolite layered silicates TAKAAKI MAEZUMI, NOBORU WADA, Toyo University, Japan — By calcinating organic-molecule intercalated taeniolite layered silicates, carbon nano-structures were made between the 2:1 layered silicate sheets. Raman scattering, XRD, TGA and SEM were used to characterize the samples. Large taeniolite crystals ($NaLiMg_2Si_4O_{10}F$) were first prepared by melting appropriate chemicals at high temperatures using a platinum crucible. Then, the taeniolite crystals made were cation-exchanged with Li^+, K^+, NH_4^+, Ca_2^+ and Mg_2^+ in salt solution. Finally, various organic molecules such as ethylene glycol, pyridine and so on were intercalated into the taeniolite crystals, and calcinated under a N_2 atmosphere at about 1000K. The resulting crystals are usually gray or black. X-ray (00l) diffraction patterns suggested that the carbon structures may be monolayer thick (i.e., graphene-like). Raman scattering spectra which exhibited a sharp G-band peak with a high G-band/D-band ratio indicated that the carbon structures were relatively well crystallized. Cation and organic-molecule dependence on the carbon structures will be discussed. In addition, evidence for stage-2 taeniolite will be presented.

Noboru Wada
Toyo University

Date submitted: 14 Nov 2014 Electronic form version 1.4