The AMS ^{14}C dating facility at NTU and its capability

Hong-Chun Li

Department of Geosciences, National Taiwan University, Taipei 10006, Taiwan

hcli1960@ntu.edu.tw

The NTUAMS Lab has been established since September 2012, equipped with a HVE 1.0MV Tandetron Model 4110 BO-Accelerator Mass Spectrometer (AMS) and two graphitization systems. In January of 2013, the AMS was passed its final acceptance tests for ^{14}C, ^{10}Be and ^{26}Al. The AMS background values for ^{14}C/^{12}C, ^{10}Be/^{9}Be and ^{26}Al/^{27}Al are 2.75×10^{-15}, 1.70×10^{-14} and 3.92×10^{-14}, respectively. We have processed the principal modern radiocarbon standards including Oxalic Acid I (HOx1), Oxalic Acid II (HOx2) and ANU (Australian National University) sucrose, yielding averages of 8.854E-13±6.889E-14(n=17), 1.138E-12±1.675E-13(n=10) and 1.393E-12±1.493E-13(n=6), respectively, under ^{14}C^{3+} mode measurement. The HOx2/HOx1 and ANU/HOx1 ratios are all close to the reported values, indicating the AMS facility sets up correctly for ^{14}C dating. A carbonate background (NTUB) which is from the upper Devonian Limestone in Guilin of China and a fossil wood (CWOC) that is from the middle Pleistocene fluvial deposit in central coast of Taiwan were measured, showing that both backgrounds have the ^{14}C/^{12}C ratios of ~3.5E-15 which is close to the AMS machine background. The results demonstrate that the NTUAMS Lab is ready to serve ^{14}C dating. Currently, the lab is able to date organic matters and carbonates with ages within 50,000 years old. The minimum sample size is about 0.3mg of C, but general size is 1mg of C. Up-to-date, we have carried out ^{14}C dating on charcoals from an archeological site in Taiwan; on marine sediments vs. organic components from Baltic Sea; on plant remains, shells and bulk TOC in sediment cores from several lakes; on a stalagmite from South Taiwan; on peat samples from a wetland in Guilin, China; and on bulk TOC from sediment cores in Guan-Du near Taipei. We also plan to build up ^{10}Be and ^{26}Al analytical system in the future.