A Single Stage Accelerator Mass Spectrometry at the Atmosphere and Ocean Research Institute, The University of Tokyo

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The National Electrostatics Corporation (NEC) 250kV single- stage AMS (YS-AMS) was installed in March 2013 at the Laboratory of Accelerator Mass Spectrometry (LAMS), the Atmosphere and Ocean Research Institute, The University of Tokyo. This is the first single-stage AMS system installed in Japan. The system is equipped with a 40 solid sample ion source (MC-SNICS-II), sequential injection system at low energy mass spectrometry side, open air 250kV high energy deck including helium gas stripper which acts as a molecular dissociation, analyzing magnet, electrostatic analyzer, sequential post-accelerator deflector, and final detector. The performance tests with 11 reference materials distributed via the International Atomic Energy Agency (IAEA), National Institute of Standards and Technology (NIST), and National Institute of Advanced Industrial Science and Technology, Japan (AIST) were in very good agreement with consensus values. Thus our routine 14C measurements have been started since August 2013 and maintaining high performance. We have measured about 6,000 unknown samples during this period. Typical 12C- currents are 27 μA at low energy Faraday cup, the transmission in the accelerator is about 42%, and precision of 14C/12C and 13C/12C is better than 0.2%. Geological, archaeological, oceanographic as well as a large number of biological samples have been measured efficiently using the current system.

Keywords: Accelerator Mass Spectrometry, Radiocarbon, high precision and high throughput

