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OAK RIDGE 25URC TANDEM ACCELERATOR

1994 SNEAP LAB REPORT

G. D. ALTON, M. R. DINEHART, D. T. DOWLING, D. L. HAYNES, C. M. JONES,
R. C. JURAS, S. N. LANE, C. T. LECROY, M. J. MEIGS, G. D. MILLS,
S. W. MOSKO, S. N. MURRAY, D. K. OLSEN, AND B. A. TATUM

Oak Ridge National Laboratory
P. O. Box 2008
Oak Ridge, Tennessee 37831-6368

Operation

The 25URC tandem accelerator is still in shut-down mode until the facility is reconfigured to produce radioactive ion beams (RIBs). Again, we have operated approximately 200 hours for ion implantation studies in support of RIB development. Gallium was accelerated for the first time in the tandem accelerator by injecting molecular gallium phosphide. Three tank openings occurred during this period; two were primarily for resistor installation (one planning/measuring and one installation) and the final one was to repair an SF₆ leak around a GVM that had been reinstalled. The tank opening for installing the resistors was also necessary due to GVM failures and failures of some ion optic components.

Operation of the accelerator has been generally very reliable with most problems being associated with power supplies and components located outside the accelerator. Our major operational problem this year was the development of internal shorts in the coils of the energy-analyzing magnet which caused beam instability. The short-term cure for the instability was the shorting of 1.5 pancakes per coil (30% of the coil) which reduced the mass-energy product of the magnet from 320 to 160 amu-MeV. New coils have been ordered and are due to arrive in January 1995.

Development

The major development activity for the tandem accelerator was the replacement of the corona-point voltage-grading system with resistors. Installation and first experience with the resistors will be detailed in a paper at this conference.

RIB Project Development

Several milestones for the RIB project have been met since SNEAP 1993. The high-voltage platforms have been built and tested at the required 300 kV. Most equipment has been installed on the platforms so that the first beam can be developed using the Mark I target-ion source. This ion source was characterized on the ion source test facility before moving it to the platform. The first beams will be stable ions from a gas feed to test beam optics and diagnostics on the platform. The second-stage mass-separator magnets have been specified and the contract has been awarded to Sigma Phi. The final optics design for the beam line from the second-stage separator to the tandem accelerator is being completed and equipment and controls are being procured. A talk detailing the progress on the RIB project will given at this conference.

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