

중이온빔을 이용한 ERD 분석 장치 시험 분석  
Test of ERD analysis system using heavy ion beam

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요 약

서울대학교 기초과학교육연구공동기기원의 질량분석 이온빔가속기 (Accelerator Mass Spectrometer : SNU-AMS)의 -10 빔포트에 ERD (Elastic Recoil Detection) 분석을 위한 빔라인과 표적함을 구성하였다[1]. 표적함 설치를 완료하여 시험 분석을 수행하였다. 또한 표적과 검출기를 자동 설정하기 위한 장치를 설치 중이다. 향후 이온빔 에너지 검정과 반도체 시료의 ERD 분석을 수행할 것이다.

Effect of Magnetic Field on Selectivity of Three-Step Photoionization

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Abstract

Effect of magnetic field on selectivity by linearly polarized lasers was analyzed by formulating the density matrix equations. To investigate the effect of magnetic field on the selectivity of AVLIS, we proposed a general Hamiltonian for multilevel atomic system in magnetic field. The population dynamics of magnetic sublevels have been observed by solving the Liouville equation. Mixing between magnetic sublevels was observed in each state during the laser excitations when the magnetic field perpendicular to the quantization axis was applied to the atomic system. The magnetic field dependence on ionization rate of even isotopes was also discussed. In the magnetic field dependence, two ionization peaks were appeared because of the interference between Rabi and Larmor frequency during the ionization process. The permissible intensities of magnetic field were predicted to obtain enough selectivity for the target isotopes of zirconium and gadolinium in the AVLIS process based on the polarization selection rule.