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Survival of Very Neutron Rich Fragments in Multifragmentation
G.A. SOULIOTIS, D.V. SHETTY, M. VESELSKY, A. BOTVINA, E. BELL, A. KEKSIS, M. JANDEL, S.J. YENNELLO, Cyclotron Institute, Texas A&M University, College Station, TX 77843 — The yield distributions of isotopically resolved projectile residues from semi-peripheral collisions of 86Kr (25 MeV/nucleon), 64Ni (25 MeV/nucleon) and 136Xe (20 MeV/nucleon) beams on a variety of targets are studied in this work. The reactions of 86Kr with 64,58Ni, 124,112Sn and 208Pb were studied with the MARS recoil separator of the Cyclotron Institute of Texas AM [1]. The reactions of 64Ni and 136Xe with 64,58Ni and 124,112Sn, as well as 208PB, 232Th were studied with the Superconducting Solenoid (BigSol) Line. Special attention is given to projectile residues, escpecially the most neutron rich ones, produced at excitation energies near the multifragmentation threshold(2-3MeV/nucleon). Both the N/Z and the kinematical properties of the observed fragments are well described by a hybrid calculation involving a deep inelastic transfer model for the dynamical stage of the collision and the statistical multifragmentation model (SMM) [2] for the de- excitation stage. Apart from a nuclear reaction standpoint, the observed survival of very neutron-rich fragments also addresses the practical issue of the production of neutron-rich rare isotopes in multifragmentation. [1] G.A. Souliotis et al., Phys. Rev. Lett. 91 (2003) 022701; Nucl. Instrum. Methods B 204 (2003) 166, [2] A.S. Botvina et al. Phys. Rev. C 65 044610 (2002) and references therein.

George Souliotis
Cyclotron Institute, Texas A&M University

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