

1. Record Nr.	UNINA9910450723003321
Autore	Nakamura Takashi
Titolo	Handbook on secondary particle production and transport by high-energy heavy ions [[electronic resource] /] / Takashi Nakamura, Lawrence Heilbronn
Pubbl/distr/stampa	Singapore ; ; Hackensack, N.J., : World Scientific, c2006
ISBN	1-281-89913-5 9786611899134 981-270-314-4
Descrizione fisica	1 online resource (237 p.)
Altri autori (Persone)	HeilbronnL
Disciplina	539.72
Soggetti	Heavy ion collisions Ion bombardment Heavy ion accelerators Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 217-221) and index.
Nota di contenuto	Preface; Contents; 5.1.4 211 and 377 MeV/nucleon Ne + Cu (Hicks et al., Bevalac (LBNL)); 1. Introduction; 1.1 Radiation in Space Environment; 1.2 Heavy-Ion Accelerators for Medical Applications; 1.3 Radioisotope (RI) Beam Factory in Large-Scale Heavy-Ion Accelerators; 1.4 Purpose of This Handbook; 2. Secondary Neutron Yields from Thick Targets; 2.1 Overview of Measured Systems; 2.2 Experimental Details; 2.2.1 HIMAC experiments; 2.2.2 NSCL experiments; 2.2.3 Bevalac experiments; 2.2.4 SREL experiments; 2.3 Results; 2.3.1 Double-differential spectra; 2.3.2 Angular distributions 2.3.3 Total yields 2.4 Double-Differential Thick-Target Yields from the HIMAC Experiments (Plots); 2.5 Double-Differential Thick-Target Yields from the Bevalac Experiments; 2.6 Double-Differential Thick-Target Yields from the SREL Experiments; 2.7 Double-Differential Thick-Target Yields from the NSCL Experiments; 2.8 Angular Distributions of Thick-Target Neutron Yields above 5 MeV from the HIMAC Experiments; 2.9 Angular and Energy Distributions of Thick-Target Neutron Yields above 20 MeV from the Bevalac Experiments

2.10 Angular Distributions of Thick-Target Neutron Yields above 10 MeV from the SREL Experiments  
2.11 Angular and Energy Distributions of Thick-Target Neutron Yields above 10 MeV from the NSCL Experiments;  
2.12 Total Yields for Systems with Al, C, Cu or Pb Targets;  
3. Secondary Neutron Production Cross Sections;  
3.1 Overview of Measured Systems;  
3.2 Experimental Details;  
3.2.1 HIMAC experiments;  
3.2.2 RIKEN experiments;  
3.2.3 Bevalac experiments;  
3.3 Results;  
3.3.1 Analysis of HIMAC experiments;  
3.3.2 Analysis of RIKEN experiments;  
3.3.3 Analysis of Bevalac experiments  
3.3.4 Double-differential spectra  
3.3.5 Angular distributions;  
3.3.6 Total yields;  
3.4 Double Differential Neutron Production Cross Sections from HIMAC Experiments;  
3.5 Double Differential Neutron Production Cross Sections from RIKEN Experiments;  
3.6 Double Differential Neutron Production Cross Sections from Bevalac Experiments.;  
3.7 Angular Distributions;  
3.8 Total Cross Sections;  
4. Measurements of HZE Neutrons Behind Shielding;  
4.1 Experimental Details;  
4.1.1 Concrete shielding using self-TOF, NE-213, and activation foils;  
4.1.2 Iron shielding using self-TOF and NE-213 detectors  
4.1.3 Concrete and iron shielding using a TEPC  
4.1.4 Bonner sphere measurements behind concrete and iron;  
4.2 Results;  
4.2.1 400 MeV/nucleon  $^{12}\text{C} + \text{Cu}$  neutrons behind concrete;  
4.2.2 400 MeV/nucleon  $^{12}\text{C} + \text{Cu}$  neutrons behind iron;  
4.2.3 400 MeV/nucleon  $^{12}\text{C} + \text{Cu}$  neutrons behind iron and concrete, TEPC measurements;  
4.2.4 155 MeV/nucleon He, C, and O + Hevimet neutrons behind iron and concrete;  
4.3 Spectra from HIMAC Experiments of Sasaki et al.;  
4.4 Spectra from HIMAC Experiments of Nunomiya et al.;  
4.5 Spectra from NSCL Experiments  
5. Production Cross Sections of Spallation Products Created in Heavy-Ion Reactions

---

## Sommario/riassunto

This handbook is a timely resource for the rapidly growing field of heavy-ion transport-model theory and its applications to the fields of accelerator development, heavy-ion radiotherapy, and shielding of accelerators and in space. Data from over 20 years of experiments in the production of secondary neutrons and spallation products are contained in the handbook, and are available on the accompanying CD. Transport modelers and experimentalists will find the detailed descriptions of the experiments and subsequent analyses to be a valuable aid in utilizing the data for their particular applicati

---