



Boletim Informativo



Ano III - Nº 07-12/06
Julho - Dezembro 2006

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Biblioteca do ITN



Pesquisa na Base de Dados de Livros do ITN

Os livros introduzidos até ao momento já estão disponíveis para pesquisa, num dos computadores da Biblioteca, utilizando a aplicação



Mais informações:

[\\itn.pt\Biblioteca\Porbase5\Manuais\ManualPac.htm](http://itn.pt/Biblioteca/Porbase5/Manuais/ManualPac.htm)

Todas as publicações aqui referenciadas encontram-se disponíveis para consulta na Biblioteca.

Recortes de Imprensa

Jornal da Água e Ambiente (em exposição na Biblioteca)

<http://aguaeambiente.ambienteonline.pt/>

Julho 2006 - nº 92

água &
ambiente

Entrevista

JÚLIO MONTALVÃO E SILVA

«Não é possível acontecer um acidente como o de Chernobyl no Ocidente»

O presidente do Instituto Tecnológico e Nuclear considera que é necessário encetar um processo de discussão pública «ponderada, desapaixorada e sem ideias preconcebidas» em torno do novo paradigma energético para Portugal. «O recurso à energia nuclear é inevitável, mesmo que não gostemos dela», sustenta.

Água&Ambiente - Qual é a mais-valia que o ITN pode ter no desenvolvimento de Portugal?

Júlio Montalvão e Silva: O ITN concentra a maior parte do conhecimento nacional na área do nuclear. A nossa missão é desenvolver as ciências e técnicas nucleares colocando as radiações e os radioisótopos ao serviço do País. No entanto, por diversas dificuldades, o cumprimento cabal da missão do ITN obriga a uma luta permanente. Por outro lado, ao ITN são actualmente atribuídas obrigações diversas, a nível nacional, europeu e internacional, nomeadamente no domínio da protecção



Á&A - De que forma a perda de autonomia financeira afectou o funcionamento do ITN?

J.M.S.: Criou grandes dificuldades na gestão corrente. De 2003 a 2005, o ITN viu-se confrontado com uma enorme falta de flexibilidade nessa gestão, derivada de uma maior complexidade burocrática. Começámos a ter problemas com os fornecedores. Queríamos coordenar projectos e não podíamos. Felizmente, o actual Governo corrigiu a situação repondo a atribuição de autonomia financeira aos laboratórios do Estado.

[Texto Integral](#)

Agosto 2006 - nº 93

Análise

INSTITUTO TECNOLÓGICO E NUCLEAR

Odisseia ao mundo da radioactividade

É fácil associar a investigação nuclear à produção de energia. O Água&Ambiente foi visitar o Instituto Tecnológico e Nuclear, em Lisboa, e descobriu as outras valências da radioactividade. Do ambiente à medicina, os fótões e neutrões fazem história.



abrindo novo campo à datação arqueológica por carbono 14, um isótopo radioactivo. Esta análise já é feita no sector da Química, mas é demorada e necessita de amostras de considerável dimensão. «Para fins arqueológicos, por exemplo, saber a idade de um osso ou outro material orgânico através da datação por carbono 14 consiste em medir a presença deste isótopo numa pequena amostra, pois

[Texto Integral](#)

Publicações Oferecidas



- **Contents Section**
 - » The Year in Review
- **Technology:**
 - » Nuclear Power
 - » Nuclear Fuel Cycle and Material Technologies
 - » Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development
 - » Nuclear Science
 - » Food and Agriculture
 - » Human Health
 - » Water Resources
 - » Protection of the Marine and Terrestrial Environments
 - » Physical and Chemical Applications
- **Safety and Security:**
 - » Safety of Nuclear Installations
 - » Radiation and Transport Safety
 - » Management of Radioactive Waste
 - » Nuclear Security
- **Verification**
 - » Safeguards
 - » Verification in Iraq Pursuant to UNSC Resolutions
- **Management of Technical Cooperation:**
 - » Management of Technical Cooperation for Development
- **Annex:**
 - » Additional tables referred to in the Annual Report
 - » Organizational Chart

http://www.iaea.org/Publications/Reports/Anrep2005/anrep2005_full.pdf



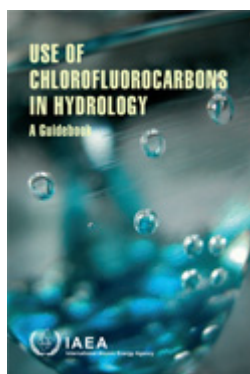
Competency Assessments for Nuclear Industry Personnel

The nuclear industry expends significant resources conducting competency assessments. Competency assessments are used for employee selection, trainee assessment, qualification, re-qualification and authorization. This publication focuses on the competency assessments used for measuring the knowledge, skills and attitudes of personnel as the result of training. Other uses of competency assessments are also briefly discussed. Ineffective testing methods and procedures, or inappropriate interpretation of test results, can have significant effects on both human performance and nuclear safety. Test development requires unique skills, and training and experience are needed to develop and improve these skills. Test item and examination development, use, interpretation of results, and examination refinement should be part of an ongoing systematic process. Testing, and particularly the results of testing, can also be used for trainee motivation, instructional improvement and programme evaluation. In addition, testing can also be used to provide teaching and feedback. For some users, this publication will provide a review of the ideas and principles of competency assessments with which they are already familiar; for others it will present new concepts. While not intended to provide in-depth coverage of assessment theory, this publication should provide developers, instructors and assessors with a foundation on which to develop sound assessments.

STI/PUB/1236, 149 pp.; 0 figures; 2006, ISBN 92-0-110105-8.

Subject Classification: 0705 - Qualification and training of personnel.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1236_web.pdf



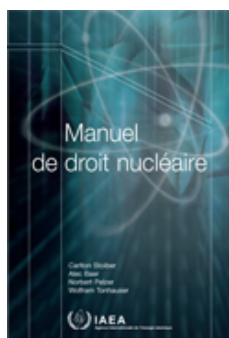
Use of Chlorofluorocarbons in Hydrology A Guidebook

Development of the chlorofluorocarbon (CFC) technique as a tool for dating groundwater has occurred over approximately the last 20 years, and a number of research publications have documented its use in specific aquifers. This publication is intended to facilitate a comparative analysis of CFC and isotope techniques and a wider use of the CFC technique under appropriate conditions by providing a description of its scientific basis, sampling and measurement methods, interpretation and limitations of data, and a variety of case studies.

STI/PUB/1238, 277 pp.; 111 figures; 2006, ISBN 92-0-100805-8, English.

Subject Classification: 0304 - Nuclear analytical techniques; 0402 - Hydrology.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1238_web.pdf



Manuel de droit nucléaire

This publication is a new resource for assessing the adequacy of national legal frameworks governing the peaceful uses of nuclear energy. It provides practical guidance for governments in enhancing their laws and regulations, in harmonizing them with internationally recognized standards, and in meeting their obligations under relevant international instruments. This handbook contains concise and authoritative information for teachers (lawyers, scientists, engineers, health and radiation protection workers and government administrators) on the basic elements of a framework for managing and regulating nuclear energy.

STI/PUB/1160, 191 pp.; 0 figures; 2006

ISBN 92-0-212306-3, French.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1160f_web.pdf



Brazil: A Country Profile on Sustainable Energy Development

This publication is the product of an international effort to develop a novel approach for the comprehensive assessment of national energy systems within a sustainable development context. The study represents the first of a series of national studies being conducted through a partnership initiative under the World Summit on Sustainable Development and the United Nations Commission on Sustainable Development. The study comprises a quantitative and qualitative analysis of Brazil's energy needs, supply and security; domestic resources; technology development and innovation; and alternative future scenarios taking into consideration sustainable development criteria and goals defined by Brazilian experts. Social, economic and environmental issues and trends are examined in detail using statistical analysis of historical data, integrated demand and supply modelling systems and Energy Indicators for Sustainable Development. The quantitative assessment is complemented by discussions of major institutional and infrastructural considerations. The report summarizes the analyses, identifies major energy priority areas for Brazil and explores policy options useful to decision makers and specialists in energy and the environment.

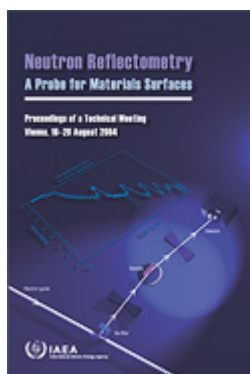
Contents: 1. Introduction; 2. Status; 3. Domestic Energy Resources; 4. Indigenous and Adapted Energy Technologies and Energy Efficiency; 5. Energy and Economic Development; 6. Energy, the Environment and Health; 7. Energy and Social Issues; 8. Energy Security; 9. Policy Options for Sustainable Energy Development; 10. Scenarios; 11. Conclusions and Lessons Learned.

STI/PUB/1247, 252 pp.; 108 figures; 2006, ISBN 92-0-104906-4, English.

Subject Classification: 0700 - Nuclear power.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1247_web.pdf

Proceedings Series



Neutron Reflectometry: A Probe for Materials Surfaces Proceedings of a Technical Meeting held in Vienna, Austria, 16-20 August 2004

Proceedings Series

Thin films and multilayers have applications in development of sensors, neutron guides and beam deflectors. Adsorption of surfactants and polymers is important in technological and industrial applications, and characterization of these thin films is essential for their use in appliances. The special features of neutron interaction with matter make neutron reflectometry a powerful tool for probing these surfaces and multilayers. It is also useful in the studies of surface corrosion of metals. The additional advantage of the method is that it can be effectively used with medium flux reactors also. This publication gives an introduction into the theory underlying this method, its potential applications and a description of existing facilities. It will be useful as a guide to the neutron beam user groups interested in developing a neutron reflectometer and enhance reactor utilization.

STI/PUB/1246, 198 pp.; 104 figures; 2006, ISBN 92-0-103906-9, English.

Subject Classification: 0304 - Nuclear analytical techniques

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1246_web.pdf



**Effective Nuclear Regulatory Systems: Facing Safety and Security Challenges
Proceedings of an International Conference held in Moscow, 27 February–3
March 2006**

Proceedings Series

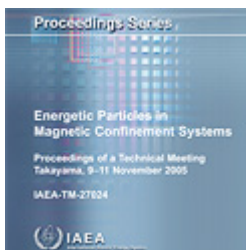
Renewed global interest in the use of nuclear energy for electricity generation, increased threats to the security of nuclear installations, increased use of radioactive materials and the challenges posed by existing nuclear facilities will require new strategies and approaches to safety and security. The aim of this conference was to enhance international cooperation in the continuous improvement of the regulatory regime for global safety and security and thereby to develop a global vision and facilitate future commitments that would lead to fulfilment of this goal.

STI/PUB/1272, 331 pp.; 20 figures; 2006, ISBN 92-0-110606-8, English.

Subject Classification: 0600 - Nuclear and Radiological Safety; 0614 - Legal and governmental aspects.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1272_web.pdf

Proceedings CD Series



**Energetic Particles in Magnetic Confinement Systems – Proceedings of a
Technical Meeting held in Vienna, Austria, 9–11 November 2005**

Proceedings CD Series

Progress on Fusion in the last decades has established the scientifically educated, optimistic perspective that fusion can be a real solution for increasing energy demands and mitigation of green house effects with negligible radioactive impact. With the recent decision on the construction of the first international experimental fusion-burning device, ITER, the scientific community has an unprecedented opportunity to address the remaining physics issues and the technology aimed at building a fusion power plant in the next two generations. Energetic particles externally injected by, for instance, the heating beams or internally generated, such as the alpha particles from the fusion reactions, can trigger major instabilities leading to loss of plasma energy and mass. These physical processes are of major importance for a fusion nuclear reactor where external heating by neutral beams and positive feedback by alpha particle heating are important mechanisms to assure realization of fusion in an economic way. This CD, contains the presentations and submitted reports presented at the 9th IAEA Technical Meeting on Energetic Particles on Magnetic Confinement Systems. A summary of the meeting is also included. A selection of papers were revised and submitted for peer review to Nuclear Fusion journal and details of these papers are also included.

STI/PUB/1283, 2006, ISBN 92-0-113406-1, English, CD-ROM.

Subject Classification: 0900 - Plasma physics and nuclear fusion.

<http://www-pub.iaea.org/MTCD/publications/PDF/P1283-cd/index.html>

IAEA Nuclear Security Series



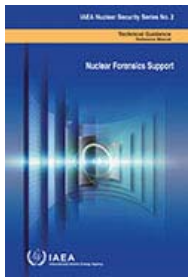
Technical and Functional Specifications for Border Monitoring Equipment Technical Guidance

IAEA Nuclear Security Series No. 1

States have the responsibility for combating illicit trafficking and inadvertent movements of radioactive material. A major portion of that effort is devoted to monitoring borders to detect and then confiscate any radioactive material which might be moving across borders in an illegal manner. The IAEA has responded to requests from its Member States to provide a set of technical specifications that can be used in the design testing, qualifying and purchasing of border radiation monitoring equipment. The purpose of this publication is to provide deployment specifications rather than just test specifications. The system parameters discussed here can be used as the specification for how the equipment will actually be deployed for border security applications rather than only for use during comparisons of equipment from various manufacturers.

STI/PUB/1240, 79 pp.; 3 figures; 2006. ISBN 92-0-100206-8, English.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1240_web.pdf



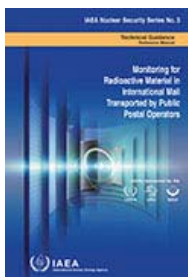
Nuclear Forensics Support Technical Guidance

IAEA Nuclear Security Series No. 2

Nuclear scientists have recognized that much can be learned from the analysis of reported cases of illicit trafficking of nuclear and other radioactive material: What specifically could the material have been used for? Where was the material obtained from: stock, scrap or waste? Was the amount seized only a sample of a much more significant quantity? These and many other questions can be answered through detailed technical characterization of seized material samples. The combination of scientific methods used for this purpose is normally referred to as nuclear forensics, which has become an indispensable tool for use in law enforcement investigations of nuclear trafficking. This publication is unique in bringing together for the first time a concise but comprehensive description of the various tools and procedures of nuclear forensics investigations that have heretofore been described independently in the scientific literature. It also incorporates the experience accumulated over the last decade by law enforcement agencies and nuclear forensics laboratories confronted with cases of illicit events involving nuclear or other radioactive materials.

STI/PUB/1241, 67 pp.; 4 figures; 2006. ISBN 92-0-100306-4, English.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1241_web.pdf



Monitoring for Radioactive Material in International Mail Transported by Public Postal Operators Technical Guidance

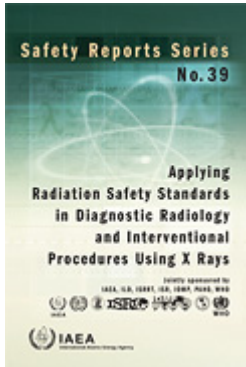
IAEA Nuclear Security Series No. 3

The illegal transport of conventional explosives and biological material has been observed in public mail and could lead to serious health hazards. In response to Member States' requests to establish guidance for detecting the movement of radioactive material in international mail, the IAEA and the Universal Postal Union (UPU) undertook a joint effort to prepare this publication. It considers how radioactive materials in international mail might be detected, how best to monitor for these materials in mail facilities and how to respond appropriately. This publication brings together a concise but comprehensive description of the various techniques and equipment used to detect and control radioactive material during mail processing.

STI/PUB/1242, 39 pp.; 4 figures; 2006. ISBN 92-0-100406-0, English.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1242_web.pdf.

Safety Reports Series



Applying Radiation Safety Standards in Diagnostic Radiology and Interventional Procedures Using X Rays

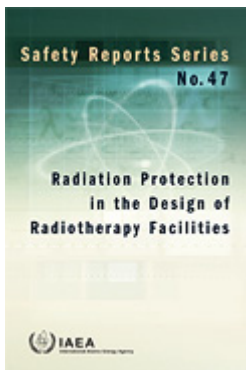
Safety Reports Series No. 39

The International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS), jointly sponsored, inter alia, by the IAEA, ILO, WHO and PAHO, establish requirements on the legal persons responsible for designing, running and decommissioning practices involving ionizing radiation. These requirements are basic and general in nature. This report is intended to be of assistance to both regulators and users of radiation sources in diagnostic radiology and interventional procedures using X rays in applying the BSS to this practice. Regulators will find it useful for reviewing applications for authorization and for the inspection of the practice. Users of radiation in radiology may follow the guidance provided in order to comply with BSS requirements or equivalent national requirements. Experts recruited on IAEA missions to advise on the implementation of the BSS for the practice of diagnostic radiology and interventional procedures using X rays are expected to use this regulatory guidance report rather than their own national regulations and guidance.

STI/PUB/1206, 96 pp.; 2 figures; 2006, ISBN 92-0-111004-9, English.

Subject Classification: 0101 - Nuclear medicine (including radiopharmaceuticals); 0103 - Medical physics (including dosimetry); 0609 - Radiation protection.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1206_web.pdf



Radiation Protection in the Design of Radiotherapy Facilities

Safety Reports Series No. 47

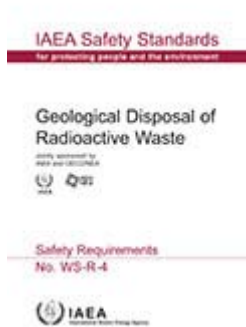
This Safety Report provides practical guidance regarding the design and shielding of radiotherapy facilities. Methods for determining the necessary structural shielding for external beam units (60Co units, linear accelerators, superficial and orthovoltage units, and simulators), as well as brachytherapy units, are described. Data used for determining the structural shielding necessary for all types of radiotherapy facilities are reproduced and example calculations are provided for each type of facility. In addition, specific design features that could be incorporated into radiotherapy facilities, including those related to the security of radioactive sources, are discussed. This report is intended to be used primarily by radiological physicists in the planning and design of new radiotherapy facilities and in the remodelling of existing facilities. Sections of the report will also be of interest to architects, civil engineers, hospital administrators and others who are concerned with the design of radiotherapy facilities. In addition, the guidance in the report will be useful to regulatory personnel responsible for the licensing and inspection of these facilities.

STI/PUB/1223, 129 pp.; 18 figures; 2006, ISBN 92-0-100505-9.

Subject Classification: 0103 - Medical physics (including dosimetry); 0609 - Radiation protection.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1223_web.pdf

Safety Standards Series



Geological Disposal of Radioactive Waste Safety Requirements

Safety Standards Series No. WS-R-4

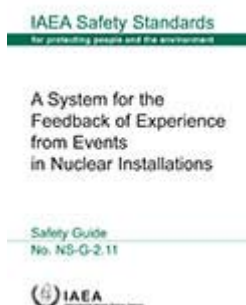
This Safety Requirements publication is concerned with providing protection for people and the environment from the hazards associated with waste management activities related to disposal, i.e. hazards that could arise during the operational period and following closure. It sets out the protection objectives and criteria for geological disposal and establishes the requirements that must be met to ensure the safety of this disposal option, consistent with the established principles of safety for radioactive waste management. It is intended for use by those involved in radioactive waste management and in making decisions in relation to the development, operation and closure of geological disposal facilities, especially those concerned with the related regulatory aspects.

Contents: 1. Introduction; 2. Protection of human health and the environment; 3. The safety requirements for geological disposal; 4. Requirements for the development, operation and closure of geological disposal facilities; Appendix: Assurance of compliance with the safety objective and criteria; Annex I: Geological disposal and the principles of radioactive waste management; Annex II: Principles of radioactive waste management.

STI/PUB/1231, 49 pp.; 0 figures; 2006, ISBN 92-0-105705-9, English.

Subject Classification: 0611 - Radioactive waste management; 0803 - Spent fuel management.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1231_web.pdf



A System for the Feedback of Experience from Events in Nuclear Installations Safety Guide

Safety Standards Series No. NS-G-2.11

This Safety Guide provides recommendations on all the main components of operational experience feedback systems, utilizing relevant information on events and abnormal conditions that have occurred at nuclear installations around the world. It focuses on the interaction between the different systems for using operational experience feedback and constitutes an update and an extension of Part I, A National System, of Systems for Reporting Unusual Events in Nuclear Power Plants (IAEA Safety Series No. 93)

Contents: 1. Introduction; 2. Need for and main element of a national system for the feedback of operational experience; 3. Screening of events; 4. Investigation and analysis of events; 5. Corrective actions; 6. Trending and review to recognize emergent problems; 7. Utilization, dissemination and exchange of operating experience information; 8. Reviewing the effectiveness of the process for feedback of operational experience; 9. Quality assurance; 10. Reporting of safety related events; Appendix I: Reporting criteria and categories; Appendix II: Type of reports, timing, format and content; Appendix III: Investigation and analysis of events; Appendix IV: Approval and implementation of corrective actions; Annex I: OEF data management; Annex II: Example of elements of a national operating experience.

STI/PUB/1243, 61 pp.; 1 figures; 2006, ISBN 92-0-101406-6, English.

Subject Classification: 0603 - Nuclear power plants; 0613 - Quality management.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1243_web.pdf

IAEA Safety Standards

for protecting people and the environment

Application of
the Management System
for Facilities and Activities

Safety Guide
No. GS-G-3.1



Application of the Management System for Facilities and Activities Safety Guide

Safety Standards Series No. GS-G-3.1

This publication provides guidance for following the requirements for management systems that integrate safety, health, security, quality assurance and environmental objectives. A successful management system ensures that nuclear safety matters are not dealt with in isolation but are considered within the context of all these objectives. The aim of this publication is to assist Member States to establish and implement effective management systems that integrate all aspects of managing nuclear facilities and activities in a coherent manner.

Contents: 1. Introduction; 2. Management systems; 3. Management responsibility; 4. Resource management; 5. Process implementation; 6. Measurement, assessment and improvement; Appendix I: Transition to an integrated management system; Appendix II: Activities in the document control process; Appendix III: Activities in the procurement of documents; Appendix IV: Performance of independent assessments; References; Annex I: Electronic document management system; Annex II: Media for record storage; Annex III: Record retention and storage; Glossary.

STI/PUB/1253, 123 pp.; 1 figures; 2006, ISBN 92-0-106606-6, English.

Subject Classification: 0603 - Nuclear power plants; 0702 - Nuclear power operations.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1253_web.pdf

IAEA Safety Standards

for protecting people and the environment

The Management System
for Facilities and Activities

Safety Requirements
No. GS-R-3



The Management System for Facilities and Activities Safety Requirements

Safety Standards Series No. GS-R-3

This publication establishes requirements for management systems that integrate safety, health, security, quality assurance and environmental objectives. A successful management system ensures that nuclear safety matters are not dealt with in isolation but are considered within the context of all these objectives. The aim of this publication is to assist Member States to establish and implement effective management systems that integrate all aspects of managing nuclear facilities and activities in a coherent manner. It details the planned and systematic actions necessary to provide adequate confidence that all these requirements are satisfied.

Contents: 1. Introduction; 2. Management system; 3. Management responsibility; 4. Resource management; 5. Process implementation; 6. Measurement, assessment and improvement.

STI/PUB/1252, 27 pp.; 0 figures; 2006, ISBN 92-0-106506-X, English.

Subject Classification: 0603 - Nuclear power plants; 0702 - Nuclear power operations.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1252_web.pdf

Storage of Radioactive Waste Safety Guide

Safety Standards Series No. WS-G-6.1

IAEA Safety Standards

for protecting people and the environment

Storage of
Radioactive Waste

Safety Guide
No. WS-G-6.1



This safety guide addresses the design and operational safety of radioactive waste storage facilities that serve nuclear installations, and industrial, medical and research facilities. It covers the storage of all types of radioactive waste, excluding spent nuclear fuel and waste from mining and minerals processing. Separate guidance is provided for those who regulate and operate small storage facilities, for example, stores for radioactive waste from medicine, research and industry. Guidance is also provided on topics such as waste segregation, decay storage and storage of disused sealed sources. All countries that use radioactive materials have waste to store and therefore this safety guide should find application in most countries.

Contents: 1. Introduction; 2. Protection of human health and the environment; 3. Roles and responsibilities; 4. Common safety considerations for waste storage facilities; 5. Design and operation of small storage facilities for radioactive waste; 6. Design and operation of large storage facilities for radioactive waste.

STI/PUB/1254, 55 pp.; 0 figures; 2006, ISBN 92-0-106706-2, English.

Subject Classification: 0608 - Waste repositories; 0804 - Waste management.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1254_web.pdf

Fundamental Safety Principles

Safety Standards Series No. SF-1

IAEA Safety Standards

for protecting people and the environment

Fundamental
Safety Principles



Safety Fundamentals
No. SF-1



This publication states the fundamental safety objective and ten associated safety principles, and briefly describes their intent and purpose. The fundamental safety objective — to protect people and the environment from harmful effects of ionizing radiation — applies to all circumstances that give rise to radiation risks. The safety principles are applicable, as relevant, throughout the entire lifetime of all facilities and activities — existing and new — utilized for peaceful purposes, and to protective actions to reduce existing radiation risks. They provide the basis for requirements and measures for the protection of people and the environment against radiation risks and for the safety of facilities and activities that give rise to radiation risks, including, in particular, nuclear installations and uses of radiation and radioactive sources, the transport of radioactive material and the management of radioactive waste.

STI/PUB/1273, 21 pp.; 0 figures; 2006, ISBN 92-0-110706-4, English.

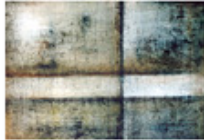
Subject Classification: 0600 - Nuclear and Radiological Safety.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1273_web.pdf

IAEA International Law Series

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

IAEA International Law Series No. 1



 IAEA
International Atomic Energy Agency

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

IAEA International Law Series No. 1

This publication brings together in a more convenient format the official records and other relevant documents relating to the negotiations on the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. The Convention applies to spent fuel and radioactive waste resulting from civilian nuclear reactors and applications and to spent fuel and radioactive waste from military or defence programmes if and when such material is transferred permanently to and managed within exclusively civilian programmes, or when declared as spent fuel or radioactive waste for the purpose of the Convention. The Convention also applies to planned and controlled releases into the environment of liquid or gaseous radioactive material from related nuclear facilities. The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, the first legal instrument to directly address these issues on a global scale, entered into force on 18 June 2001.

STI/PUB/1249, 125 pp.; 0 figures; 2006, ISBN 92-0-105506-4.

Subject Classification: 0804 - Waste management; 1100 - Legal matters.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1249_web.pdf

Amendment to the Convention on the Physical Protection of Nuclear Material

IAEA International Law Series No. 2



 IAEA
International Atomic Energy Agency

Amendment to the Convention on the Physical Protection of Nuclear Material

IAEA International Law Series No. 2

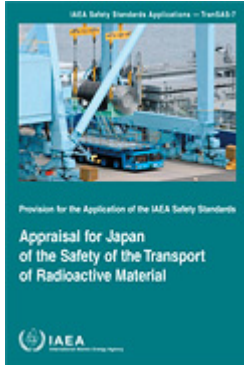
This publication brings together in a more convenient format the official records and other relevant documents relating to the negotiations on the Amendment to the Convention on the Physical Protection of Nuclear Material. The Amendment makes it legally binding for States Parties to protect nuclear facilities and material in peaceful domestic use, storage and transport. It also provides for expanded cooperation between and among States regarding rapid measures to locate and recover stolen or smuggled nuclear material, mitigate any radiological consequences of sabotage, and prevent and combat related offences. The Amendment constitutes an important milestone in the global efforts to combat nuclear terrorism.

STI/PUB/1275, 158 pp.; 0 figures; 2006, ISBN 92-0-110806-0.

Subject Classification: 0614 - Legal and governmental aspects; 1100 - Legal matters; 1400 - Physical protection of radioactive material.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1275_web.pdf

IAEA Safety Standards Applications - *TransSAS*



Appraisal for Japan of the Safety of the Transport of Radioactive Material

IAEA Safety Standards Applications - *TransSAS-7*

The IAEA's Statute authorizes it to provide for the application of its standards at the request of any State. The IAEA discharges this statutory function through a number of mechanisms, including rendering independent peer review appraisal services to determine the status of compliance with its standards. Consistent with this statutory function, resolution GC(42)/RES/13 requested the IAEA Secretariat to provide for the application of the Transport Regulations by, inter alia, providing a service for carrying out, at the request of any State, an appraisal of the implementation of the Transport Regulations by that State. The objective of a *TransSAS* mission is to assist any requesting State to achieve a high level of safety in the transport of radioactive material by reviewing its implementation of the Transport Regulations and by making recommendations for improvement where appropriate. Since *TransSAS* was established, missions have been fielded to Slovenia (1999), Brazil (April 2002), the United Kingdom (June 2002), Turkey (March 2003), Panama (June 2003), and France (March–April 2004). The appraisal for Japan in December 2005 on the safety of the transport of radioactive material is the seventh *TransSAS* mission since the inception of the service. This report presents its findings.

STI/PUB/1267, 134 pp.; 13 figures; 2006, ISBN 92-0-109506-6, English.

Subject Classification: 0606 - Transport of radioactive material.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1267_web.pdf

INSAG Series



Stakeholder Involvement in Nuclear Issues

INSAG Series No. 20

Many of the world's nuclear power plants were constructed long ago without significant public involvement in the associated decision-making. It is anticipated, however, that a variety of stakeholders will seek participation in such decisions now as the nuclear option is being revisited in many places. Accidents, notably at Three Mile Island and Chernobyl, have served to arouse public concern. The development of "here-and-now" media capabilities have created an awareness that may not have previously existed. Improvements in educational systems and the development of the Internet have made technical information and expertise available to individuals and locations that were previously without them. In addition, consideration of the environmental impacts of various energy strategies have moved to fore. INSAG has concluded that the expectations of stakeholders of a right to participate in energy decisions are something that the nuclear community must address. Decisions regarding such matters as the siting and construction of a nuclear power plant are no longer something that is largely the domain of a closed community of technical experts and utility executives. Today, the concerns and expectations from all manner of persons and organizations - from the local farmer to the international financial institution - must be considered. This report is intended for use by all stakeholders in the nuclear community - national regulatory authorities, nuclear power plant designers and operators, public interest organizations, the media and local and national populations.

STI/PUB/1276, 16 pp.; 0 figures; 2006, ISBN 92-0-111206-8, English.

Subject Classification: 0600 - Nuclear and Radiological Safety.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1276_web.pdf



Strengthening the Global Nuclear Safety Regime

INSAG Series No. 21

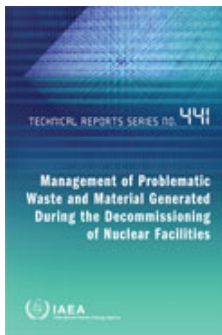
The Global Nuclear Safety Regime is the framework for achieving the world-wide implementation of the safety of nuclear installations. Its core is the activities undertaken by each Nation to ensure the safety and security of the nuclear installations within its jurisdiction. But national efforts are and should be augmented by the activities of a variety of international enterprises that facilitate nuclear safety – intergovernmental organizations, multinational networks among operators, multinational networks among regulators, the international nuclear industry, multinational networks among scientists, and other stakeholders (public, news media, NGOs) that are engaged in nuclear safety. All of these efforts should be harnessed to enhance the achievement of safety. The existing Global Nuclear Safety Regime is functioning at an effective level today. However, its impact on improving safety could be enhanced by pursuing some measured change. This report recommends action in the following areas: - Use of the review meetings of the Nuclear Safety Convention as a vehicle for open and critical peer review and a source for learning about the best safety practices of others; - Enhanced utilization of IAEA Safety Standards for the harmonization of national safety regulations to the extent feasible; - Enhanced exchange of operating experience for improving operating and regulatory practices and - Multinational cooperation in the safety review of new nuclear power plant designs. These changes, which are described more fully in this report, should serve to enhance the effectiveness of the regime.

STI/PUB/1277, 24 pp.; 0 figures; 2006, ISBN 92-0-111306-4, English.

Subject Classification: 0600 - Nuclear and Radiological Safety.

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1277_web.pdf

Technical Reports Series



Management of Problematic Waste and Material Generated During the Decommissioning of Nuclear Facilities

Technical Reports Series No. 441

Decommissioning of old nuclear facilities may introduce several problems associated with management of some specific materials and waste with not only a radioactive nature but also with chemical toxicity, other dangerous properties or complicated characteristics. Materials such as asbestos, beryllium, cadmium, mercury, lead and PCBs could be considered, which were widely used in the past in the construction of facilities. This report describes several specific forms of materials and waste generated during decommissioning of old nuclear facilities, and outlines the management options for such waste and materials, which are different from those for waste generated during the facility's normal operation.

STI/DOC/010/441, 71 pp.; 18 figures; 2006, ISBN 92-0-104605-7, English.

Subject Classification: 0804 - Waste management.

http://www-pub.iaea.org/MTCD/publications/PDF/TRS441_web.pdf



Understanding and Managing Ageing of Material in Spent Fuel Storage Facilities

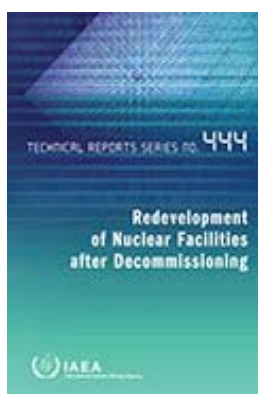
Technical Reports Series No. 443

This report results from a Coordinated Research Project on "Ageing of Materials in Spent Fuel Storage Facilities". It includes sections on the status of understanding ageing of selected materials and on management of ageing. The management of ageing is of key importance in many countries for the owners and operators of many facilities, including power reactors. There is a large measure of agreement on the general approach, which is summarized in this report. The report also includes a brief section on specific approaches in the context of fuel storage facilities and some specific recommendations. Moreover, the content has been broadened to try to appeal to those who may be in the early stages of setting up ageing management programmes either for new or for older fuel storage facilities. The report differentiates between the ageing of fuel materials from research reactors and civil reactors.

STI/DOC/010/443, 107 pp.; 5 figures; 2006, ISBN 92-0-105205-7, English.

Subject Classification: 0803 - Spent fuel

http://www-pub.iaea.org/MTCD/publications/PDF/TRS443_web.pdf



Redevelopment of Nuclear Facilities after Decommissioning

Technical Reports Series No. 444

In the coming decades a large number of nuclear facilities will reach the end of their useful lives and require decommissioning. Many of these facilities will be decommissioned with the aim of either replacing them with new facilities that serve the same purpose or reusing the site for another, completely different purpose. By recognizing and promoting the redevelopment potential of facilities and their sites at the design stage or earlier in their operating life, it is possible to enhance the prospects for worthwhile redevelopment, offsetting the costs of decommissioning and ensuring that best use is made of the material, land and human resources associated with each facility. A range of factors to consider has been identified and illustrated using case studies drawn from Member States, and practical guidance has been provided for involved parties to help promote successful and effective redevelopment of decommissioned nuclear installations in the future.

STI/DOC/010/444, 203 pp.; 49 figures; 2006, ISBN 92-0-105505-6, English.

Subject Classification: 0804 - Waste management.

http://www-pub.iaea.org/MTCD/publications/PDF/TRS444_web.pdf



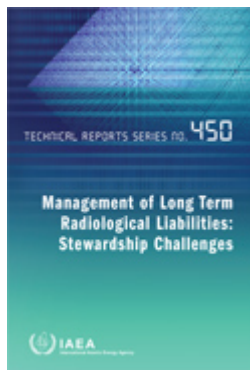
Decommissioning of Research Reactors: Evolution, State of the Art, Open Issues

Technical Reports Series No. 446

Taking into consideration the work done to date on research reactor decommissioning, it is timely to provide an up to date basis for ongoing and intended activities in this field. An evaluation of the state of the art, trends and current issues is desirable. This report reviews, from a historical perspective, decommissioning projects completed in recent years or under way, and assesses progress as well as open and new issues. It is meant to facilitate timely, safe and efficient completion of decommissioning projects for research reactors by highlighting technologies, and planning or management methodologies, and suggesting ways to overcome expected issues. The report includes a CD-ROM providing details of several hundred research reactor decommissioning projects.

STI/DOC/010/446, 156 pp.; 35 figures; 2006, ISBN 92-0-112605-0, English.

http://www-pub.iaea.org/MTCD/publications/PDF/TRS446_web.pdf



Management of Long Term Radiological Liabilities: Stewardship Challenges

Technical Reports Series No. 450

Radioactively contaminated sites often cannot be remediated to residual levels of contamination that are not of concern and released for unrestricted use. Residual contamination, buried wastes and other hazards may remain after cleanup is complete, for several reasons: technical limitations, economic feasibility, worker health and safety issues, or prevention of collateral environmental impacts. An optimization between social and economic cost and level of protection has to be found. Hence, maintenance of institutional control is likely to be required for very long periods of time. The present publication discusses the relevant issues and approaches to tackle the conceptual, managerial and technical problems of maintaining institutional control over possibly hundreds or even thousands of years. These provisions and processes for maintaining institutional control over prolonged periods of time and for managing the radiological liabilities are often referred to as 'stewardship'.

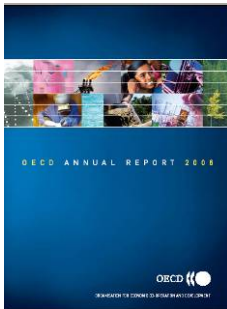
STI/DOC/010/450, 224 pp.; 26 figures; 2006, ISBN 92-0-101806-1, English.

Subject Classification: 0701 - Nuclear power planning and economics; 0800 - Nuclear fuel cycle and waste management.

http://www-pub.iaea.org/MTCD/publications/PDF/TRS450_web.pdf

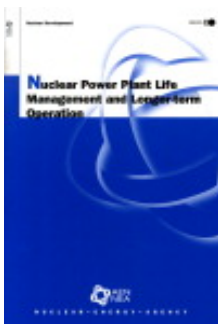


NUCLEAR ENERGY AGENCY



OECD – Annual Report 2006

<http://www.oecd.org/dataoecd/37/61/36511265.pdf>



Nuclear Power Plant Life Management and Longer-term Operation

Language: English , Published: 24-OCT-06 , 60 pages

NEA#06105, ISBN: 92-64-02924-9,

This publication is also available in French as: *Gestion et prolongation de la durée de vie des centrales nucléaires* -

Synopsis

This book, prepared by NEA member country experts, contains data and analyses relevant to nuclear power plant life management and the plants' extended, longer-term operation (LTO). It addresses technical, economic and environmental aspects and provides insights into the benefits and challenges of plant life management and LTO.

It will be of interest to policy makers and senior managers in the nuclear power sector and governmental bodies involved in nuclear power programme design and management. The data and information on current trends in nuclear power plant life management will be useful to researchers and analysts working in the field of nuclear energy system assessment.

<http://www.oecdbookshop.org/oecd/display.asp?sf1=identifiers&st1=66200611P1>

International Nuclear Law in the Post-Chernobyl Period

Language: English , Published: 17-JUL-06 , 244 pages

NEA#06146, ISBN: 92-64-02293-7

Available online at: <http://www.nea.fr/html/law/chernobyl/welcome.html>

This publication is also available in French as: *Le droit nucléaire international après Tchernobyl* -

Synopsis

The accident at the Chernobyl nuclear power plant in 1986 heightened awareness of the need to improve the international legal framework governing the safe and peaceful uses of nuclear energy. Numerous legal instruments have subsequently been adopted.

This compendium examines the developments which have taken place in international nuclear law since 1986. It reproduces a number of articles which have been published in the OECD/NEA Nuclear Law Bulletin, accompanied by some previously unpublished works. The principal legal instruments examined in this publication govern early notification and assistance in the event of a nuclear accident, nuclear safety, the safety of radioactive waste and spent fuel, and nuclear liability and compensation.



***Forty Years of Uranium Resources, Production and Demand in Perspective
"The Red Book Retrospective"***

Language: English , Published: 13-SEP-06 , 278 pages

NEA#06096, ISBN: 92-64-02806-4

Synopsis

The "Red Book", jointly prepared by the OECD Nuclear Energy Agency (NEA) and the International Atomic Energy Agency (IAEA), was first published in 1965 and has since grown to be a recognised world reference on uranium. Over the 40 years of its existence, the Red Book has collected an impressive quantity of official data supplied by governments.

The Red Book Retrospective was undertaken to collect, collate, analyse and publish all of the key information collected in the 20 editions of the Red Book published between 1965 and 2004. Additionally, every effort has been made to fill in gaps in the record to provide the most complete and exhaustive information possible. As a result, the Red Book Retrospective gives a full historical profile of the world uranium industry in the areas of exploration, resources, production, reactor-related requirements, inventories and price. It provides in-depth information relating to the histories of the major uranium-producing countries including Australia, Canada, France, Germany (including the former German Democratic Republic), the Russian Federation (including the former Union of Soviet Socialist Republics) and the United States. For the first time, for example, a comprehensive look at annual and cumulative production and demand of uranium since the inception of the atomic age is possible. Besides reporting and documenting the historical data, expert analyses provide fresh insights into important aspects of the industry including: the cost of discovery, resources to production ratios and the time to reach production after discovery, among others.

Taken together, the Red Book Retrospective provides the most complete record of the uranium industry publicly available, dating from the birth of civilian nuclear energy through to the dawn of the 21st century.

<http://www.oecdbookshop.org/oecd/display.asp?sf1=identifiers&st1=662006091P1>

Publicações Periódicas – Oferecidas

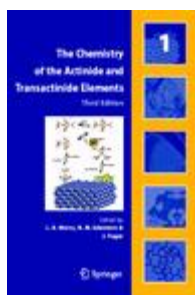


<http://www.labtimes.org/>

<http://www.labtimes.org/current/start.html>

Publicações adquiridas por Projectos do ITN

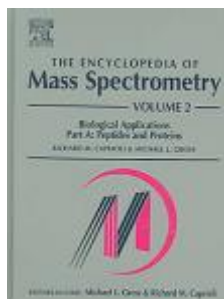
Livros de Referência (R)



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The Chemistry of the Actinide and Transactinide Elements (5 Volumes)

Morss, L.R.; Edelstein, N.M.; Fuger, J.; Katz, J.J. (Eds.)
Originally published by Wiley, New York, 1957/8 and Chapman & Hall, 1986
3rd ed., 2006, XVIII, 3664 p., Hardcover
ISBN-10: 1-4020-3555-1
ISBN-13: 978-1-4020-3555-5



R
S-TFQ-EM
GRO.1-IV

The Encyclopedia of Mass Spectrometry:

Author: M. L. Ed Gross, Nico Nibbering (Editor)
Publisher: Elsevier Science Publishing Company, December 2004
ISBN: 0080438466

Volume 4: Fundamentals of and Applications to Organic (and Organometallic) Compounds

Volume Editor: Professor Nico M. M. Nibbering
ISBN 0080438466

This volume presents a cross section of the field of organic and organometallic mass spectrometry in two parts: the first part is devoted to the fundamentals of the mass spectrometry of organic and organometallic compounds and the second part to applications of mass spectrometry to organic and organometallic compounds, either available as pure compounds or present in very complex samples or mixtures.

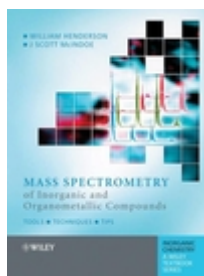
Readers will obtain not only detailed information about the selected topics with appropriate references to the original literature, but also an impression of the present scientific status of the field and its possible future directions.

* Cross section of the field of Organic and Organometallic MS

* Covers fundamental Ion Chemistry as well as applications from simple to complicated systems

* Suitable for new graduate students entering the field

<http://www1.elsevier.com/homepage/sal/emas/Contents.html#Volume4>



Mass Spectrometry of Inorganic and Organometallic Compounds: Tools Techniques Tips

[William Henderson, J. Scott McIndoe](#)

ISBN: 978-0-470-85016-9

Paperback

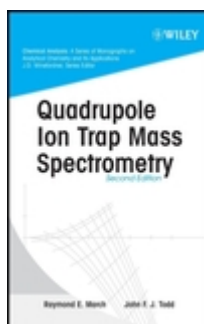
292 pages

February 2005

<http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0470850167.html>

TFQ-EM

HEN.1



Quadrupole Ion Trap Mass Spectrometry, 2nd Edition

[Raymond E. March, John F. Todd](#)

ISBN: 978-0-471-48888-0

Hardcover

346 pages

September 2005

<http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0471488887.html>

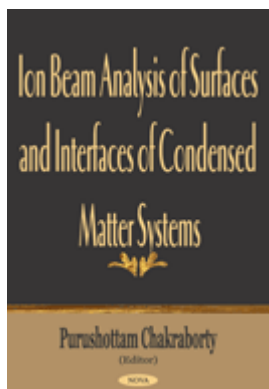
TFQ-EM

MAR.1

Handbook of Hydraulic Resistance, Third Edition

By: I.E. Idelchik

The Handbook of Hydraulic Resistance, 3rd Edition, is the updated and expanded new edition of this best-selling reference. New topics considered include the elements of aerodynamics and hydraulics of pressure systems, as well as the physico-mechanical processes in the elements of pipelines. The book also offers recommendations regarding the calculation and selection of the elements of networks and means for decreasing the fluid resistance in shaped parts of pipelines. Hundreds of sketches, diagrams, and graphs are used to illustrate key concepts. The handbook of Hydraulic Resistance, 3rd Edition, is an invaluable reference for engineers and researchers in the fields of mechanical, nuclear, power, civil, chemical, HVAC, and petroleum engineering.



Ion Beam Analysis of Surfaces and Interfaces of Condensed Matter Systems

Authors: Chakraborty, Purushottam (Saha Institute of Nuclear Physics)

Book Description:

The precision analysis of surfaces and interfaces of condensed matter systems is an area of significant importance in materials science and fascinates the scientific community. One of the reasons is that a well-characterized surface is an excellent system to test ideas about the physics of two-dimensional systems in both traditional solids like metals and semiconductors and in liquids, polymers and other organic materials. As technological advances have been made, a wide range of techniques characterizes surface systems of inherent complexities that are markedly different from those of bulk systems. Since each technique has its own characteristics with particular advantages over the other, complimentary analytical tools are generally used for surface characterizations that are at least adequate for the purpose of the user.

With the rapid advancement in the techniques related to materials analysis, parallel developments in the ion beam methods have been made, generating a great deal of popularity for uses in analyzing surfaces and interfaces. In quantitative analyses, ion beams are accepted as a favored means owing to their extreme controllability. With the developments and diversification in ultra high vacuum and ion source instrumentation, complex ion optical designs have been realized simultaneously, eventually making ion beam methods a state-of-the-art means for probing surfaces and interfaces of condensed matter systems.

Table of Contents:


Preface; Chapter 1: Application of Low Energy Ion Scattering to Alloy Surfaces and Surface Alloys (D. J. O'Connor, University of Newcastle); Chapter 2: Direct Recoil and Ion Scattering Spectrometries as Probes of Liquid Surfaces (Michael Tassotto and Philip R. Watson, Oregon State University); Chapter 3: New Trends in Rutherford Backscattering Spectrometry (Émile J. Knystautas, Université Laval); Chapter 4: RBS and Channeling Analysis of Self-Assembled Structures (B. N. Dev, Institute of Physics, Sachivalaya Marg); Chapter 5: ERDA: A Tool for Surface and Near-Surface Studies (D.K.Avasthi, Nuclear Science Center, New Delhi; and Walter Assmann, Ludwig Maximilians University); Chapter 6: Light Emission from Sputtered Particles (Chin Shuang Lee, National Central University, Taiwan); Chapter 7: Dynamic Secondary Ion Mass Spectrometry for Compositional Analysis of Interfaces (Purushottam Chakraborty, Saha Institute of Nuclear Physics); Chapter 8: Surface Analysis with Slow, Highly Charged Ions like Au⁶⁹⁺: TOF-SIMS and the Probing of Nano-Environments (Thomas Schenkel, Lawrence Berkeley National Laboratory); Chapter 9: Application of Low Energy Ions to Modify Multilayer Systems for Improved X-ray Reflectivity.(J. Verhoeven, FOM Institute for Atomic and Molecular Physics); Chapter 10: Bombardment-Induced Topography on Semiconductor Surfaces (Johan B Malherbe, University of Pretoria); Chapter 11: High Energy Ion Implantation in GaAs: Optical, Electrical and X-ray Investigations (Y.P. Ali, Hadharamout University; A.R. Damle, B.V. Polytechnic; Geeta P. Nair and A.M. Narsale, University of Mumbai; K.S. Chandrasekaran and B.M. Arora, Tata Institute of Fundamental Research); Index.

TESES

Doutoramento

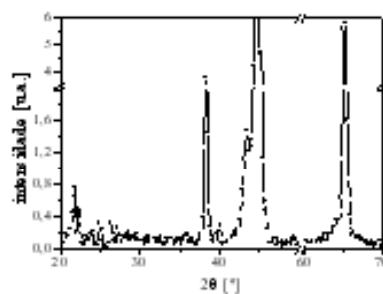
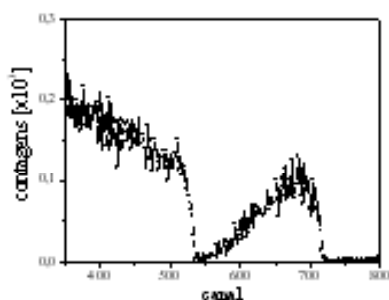


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Faculdade de Ciências e Tecnologia

Lisboa 2006

Licenciatura



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Universidade de Évora
Curso de Licenciatura em Química

**A Espectrometria de Fluorescência de Raios X na
Caracterização Química de Sedimentos da Zona
Estuarina do Rio Minho**



Relatório de Estágio realizado por:
Ana Casaca Lobato

Évora 2005