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Who's who The Stationery Office

The results of an experimental study of zone refining of the binary system triphenyl antimony-biphenyl are presented. The isotope Sb124, which is a strong gamma emitter, was employed as a tracer; this allowed a rapid in situ nondestructive analysis, closely spaced experimental points, and the opportunity to study distribution as a function of varying experimental conditions. With the aid of computers (IBM 7090 and IBM 7044) apparent (distribution coefficients) were calculated and the experimental data compared with those predicted from various mathematical models. (Author).

Government Reports

Announcements World Scientific

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Chemical News and Journal of Physical Science National Academies Press

An annual biographical dictionary, with which is incorporated "Men and women of the time."

Scientific and Technical Aerospace Reports

DIANE Publishing

A theoretical analysis is made of the electromagnetic fields in two homogeneous media separated by a plane interface with a point source located in the denser medium. The solution is expressed in the form of integrals which cannot be evaluated

explicitly. Asymptotic evaluations of the integrals have been made by many investigators using the saddlepoint technique. In the present work, all known asymptotic results are presented in one comprehensive form, using a modification of the method suggested by Lighthill for the asymptotic evaluation of the Fourier integrals. The regions of validity of the solutions are indicated wherever possible. The advantage of this method over others is its ease and simplicity. The present results agree term by term with the earlier ones of Banos and Wesley (1953-1954), and Paul (1959), who investigated the case of a source and receiver close to the interface, and an arbitrary location of source and receiver, respectively. The results obtained in the report are also compared with those of Stein (1955). (Author).

Experimental Study of Zone Refining of the Binary System Triphenyl Antimony-biphenyl The bibliography of AFCRL in-house technical reports lists all reports issued in the existing series. In addition, appendices list reports issued from 1962 to 1964 when series designations were not used, and reports issued in now-defunct series.

Physics of the M ö ssbauer Effect Scintillation was observed during an experiment with an Hg 198 light, a rotating mirror, and a Fabry-Perot interferometer. The mechanism postulated for the phenomenon is an acceleration component in the ray path, caused by curvatures within the mirror surfaces. (Author).

A Study of Band Edge Distortion in Heavily Doped Germanium

Scores of talented and dedicated people serve the forensic science community, performing vitally important work. However, they are often constrained by lack of adequate resources, sound policies, and national support. It is clear that change and advancements, both systematic and scientific, are needed in a number of forensic science disciplines to ensure the reliability of work, establish enforceable standards, and promote best practices with consistent application. Strengthening Forensic Science in the United States: A Path Forward provides a

detailed plan for addressing these needs and suggests the creation of a new government entity, the National Institute of Forensic Science, to establish and enforce standards within the forensic science community. The benefits of improving and regulating the forensic science disciplines are clear: assisting law enforcement officials, enhancing homeland security, and reducing the risk of wrongful conviction and exoneration. Strengthening Forensic Science in the United States gives a full account of what is needed to advance the forensic science disciplines, including upgrading of systems and organizational structures, better training, widespread adoption of uniform and enforceable best practices, and mandatory certification and accreditation programs. While this book provides an essential call-to-action for congress and policy makers, it also serves as a vital tool for law enforcement agencies, criminal prosecutors and attorneys, and forensic science educators.

Division of Isotopes Development and Contractor Publications

An experimental study on the zone refining of the binary system triphenyl antimony-benzoic acid is described. The isotope Sb124, which is a strong gamma emitter, was employed as a tracer; this allowed a rapid in situ nondestructive analysis, closely spaced experimental points, and the opportunity to study distribution as a function of varying experimental conditions. With the aid of computers (IBM 7090 and IBM 7044) apparent k's were calculated and the experimental data compared with those predicted from various mathematical models. (Author).

Experimental Study of Zone Refining of the Binary System Triphenyl Antimony-benzoic Acid

Identifies and describes specific government assistance opportunities such as loans, grants, counseling, and procurement contracts available under many agencies and programs. Update to the ... Catalog of Federal Domestic Assistance

Annotation Gingras (history, U. of Quebec) describes the evolution of teaching into scientific research in Canada during the late 19th century, the demands of World War I, the national establishment in place by 1930, and the subsequent issues within the research

community. Translated from the French. Annotation(c) 2003 Book News, Inc., Portland, OR (booknews.com).

TID.

The mapping of extended, cultural ground targets by an airborne radar is examined using communication theory concepts including those of the antenna transfer function and the target spatial frequency spectrum. Use of the set of transfer functions that correspond to Taylor aperture distributions and specification of the targets directly in terms of their spatial frequency spectra, permits one to examine the antenna images for quality and resolution. The results obtained indicate that resolution for a class of ground targets can be much better than is predicted by the two-point Rayleigh resolution criterion. It is also true that there can be situations in which the shape of the antenna images are quite independent of the radiation pattern. Several types of spatial noise were also included in the input spectrum to investigate noise effects on image quality and resolution. (Author).

Final Report of the Advisory Committee on Weather Control

Details of the energy band structure of degenerate n-type germanium were determined by analysis of fine structure in the 4.2K volt-ampere characteristic of germanium tunnel diodes. No shift in the relative energy of the conduction band minima was observed. The band edge is found to be exponentially distributed with $1/e$ energies of the order of 10 MeV. There appears to be an ordering mechanism among the group V impurity atoms used as substrate dopants. (Author).

Wave Phenomena in Ionized Gases

This paper considers from a simple physical point of view the Mossbauer effect, i. e., the 'recoilless emission' of gamma-rays from a nucleus bound in a crystal lattice. It begins with a discussion of the kinematics of gamma-ray emission from such a nucleus. The idealized case of a massive 'lattice' characterized by a single frequency and the more realistic one and three-dimensional models are treated. We point up the fact that in the Mossbauer effect the lattice as a whole (the lattice center of mass) always recoils after photon emission, so that the term 'recoilless emission' is in one sense misleading. We emphasize that the essence of the Mossbauer effect is not photon emission without recoil, but rather is photon emission without transfer of energy to internal degrees of freedom of the lattice. Using the basic ideas of quantum mechanics, namely, the rules for the manipulation of probability amplitudes (the so-called 'transformation theory'), we calculate the probability for recoil without excitation of internal degrees of freedom, i. e., the Mossbauer f-factor, on the assumption that the individual photon emissions, consequent lattice recoil, are instantaneous. In Appendix A we discuss this question of

instantaneous emission in some detail, and show how it is not in contradiction with the fact that the nuclear transition that leads to the gamma-ray emission has a finite half-width. In Appendix B those rules of transformation theory that are used in the body of the paper are summarized. (Author).

Final Report of the Advisory Committee on Weather Control

The increased presence of foreign students in graduate science and engineering programs and in the scientific workforce has been and continues to be of concern to some in the scientific community. Enrollment of U.S. citizens in graduate science and engineering programs has not kept pace with that of foreign students in those programs. In addition to the number of foreign students in graduate science and engineering programs, a significant number of university faculty in the scientific disciplines re foreign, and foreign doctorates are employed in large numbers by industry. Many in the scientific community maintain that in order to compete with countries that are rapidly expanding their scientific and technological capabilities, the country needs to bring to the United States those whose skills will benefit society and will enable us to compete in the new-technology based global economy. However, the academic community is concerned that the more stringent visa requirements for foreign students may have a continued impact on enrollments in colleges and universities. There are those who believe that the underlying problems of foreign students in graduate science and engineering programs is not necessarily that there are too many foreign-born students, but that there are not enough U.S. students pursuing scientific and technical disciplines.

A Study of a Scintillation Mechanism

In the last 20 years the disciplines of particle physics, astrophysics, nuclear physics and cosmology have grown together in an unprecedented way. A brilliant example is nuclear double beta decay, an extremely rare radioactive decay mode, which is one of the most exciting and important fields of research in particle physics at present and the flagship of non-accelerator particle physics. While already discussed in the 1930s, only in the 1980s was it understood that neutrinoless double beta decay can yield information on the Majorana mass of the neutrino, which has an impact on the structure of space-time. Today, double beta decay is indispensable for solving the problem of the neutrino mass spectrum and the structure of the neutrino mass matrix. The potential of double beta decay has also been extended such that it is now one of the most promising tools for probing beyond-the-standard-model particle physics, and gives access to energy scales beyond the potential of future accelerators. This book presents the breathtaking manner in which achievements in particle physics have been made from a nuclear physics process. Consisting of a 150-page highly factual overview of the field of double beta decay and a 1200-page collection of the most

important original articles, the book outlines the development of double beta decay research theoretical and experimental from its humble beginnings until its most recent achievements, with its revolutionary consequences for the theory of particle physics. It further presents an outlook on the exciting future of the field.

Protecting the Arctic

The Boltzmann equation corresponding to an electromagnetic wave propagating in a magnetoactive plasma is solved by making a spherical harmonic expansion of the electron distribution function. The problem of a plane, monochromatic wave normally incident upon a nonlinear, anisotropic, inhomogeneous plasma slab is also considered.

The Electrical Review

This report calls for a halt on Arctic oil drilling until: a pan-Arctic oil spill response standard is in place; a stricter financial liability regime for oil and gas operations is introduced that requires companies to prove that they can meet the costs of cleaning up; an oil and gas industry group is set up to peer-review companies' spill response plans and operating practices, reporting publicly; further independent research and testing on oil spill response techniques in Arctic conditions is conducted, including an assessment of their environmental side-effects; an internationally recognised environmental sanctuary is established in at least part of the Arctic. Drilling is only currently feasible in the Arctic during a short summer window and if a blow-out occurred just before the dark Arctic winter returned it may not be possible to cap it until the following summer - potentially leaving oil spewing out under the ice for six months or more with devastating consequences for wildlife. This report also warns that a collapse in summer Arctic sea-ice, increased methane emissions from thawing permafrost, melting of the Greenland ice-sheet and changes to the thermo-haline circulation could all have disastrous consequences for the world - pushing up sea levels and transforming weather patterns. Temperature rises in the Arctic are already affecting the UK's weather. The report points out that there are already more proven fossil fuel reserves in the world than can be burnt safely and calls on the Government to rethink its approach to combating climate change by tackling the supply of fossil fuels, as well as demand

On the Resolving Power of Ground Mapping Radar Antennas

Radio Frequency Propagation Through an Inhomogeneous, Magnetoactive, Nonlinear Plasma Medium

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