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ABSTRACTS FROM EAST EUROPEAN

SCIENTIFIC AND TECHNICAL JOURNALS

No. 126

- Physics and Mathematics Series -

This report consists of abstracts of articles from the East European scientific and technical journals listed in the table of contents below.

Table of Contents

CZECHOSLOVAKIA

SILAR, Josef, Tesla Pardubice, Research Works at Premysleni. (Vyzkumny ustav Premysleni).

"Basic characteristics of GM-Counters and the quality of the GM-Counters Produced in Research Works at Premysleni."

Prague, Jaderna Energie, Vol 9, No 2, Feb. 1963, pp37-45.

Abstract [English summary modified]: The basic characteristics of GM-Counters considered as a complete instrument, are described. Some parameters are compared with those of scintillation detectors. The statistical dispersion of plateau length and slope, and the background connected with the design of the instruments of 1961 production is discussed. The properties described demonstrate good quality of the counters.
3 Czech, 1 French reference.

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CZECHOSLOVAKIA

MALASEK, Eduard, Ministry of Chemical Industry (Ministerstvo Chemickeho Prumyslu)
ZOCH, Oldrich, Secretariate of the Commission for Atomic Energy (Sekretariat komise pro atomovou energii)

"Low Activity Waste Treatment Preceding Permanent Storage"

Prague, Jaderna Energie, Vol 9, No 2, Feb. 1963, pp 45-48.

Abstract [English summary modified]: Article compares the nature of the radioisotopes used in Czechoslovakia to those used in the U.S.A. and discusses the cost of waste disposal. Convenient processing and packaging is of great importance for permanent storage of radioactive waste. It leads to the increase of safety and to the lowering of the treatment and storage costs. Methods used for treatment and packaging of individual types of low activity wastes in the plants of users of the isotopes are evaluated and the future outlook of the industry in Czechoslovakia is outlined. 7 Czech references.
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CZECHOSLOVAKIA

SEIDL, Karel, Institute for Nuclear Research Czechoslovak Academy of Science, Rez near Prague. (Ustav Jaderneho Vyzkumu CSAV).

"Uranium Dioxide as a Nuclear Fuel."

Prague, Jaderna Energie, Vol 9, No 2, Feb. 1963, pp 49-58.

Abstract [English summary modified]: The general development of nuclear power plants is described. High temperature reactors, because they increase the economy of operation, are preferred at present. Uranium dioxide is the most frequently used high temperature reactor fuel. The article lists the properties of this fuel. The fabrication processes and the behaviour of UO_2 during irradiation are briefly discussed. Uranium dioxide fuel reprocessing is still in the developmental stage and a general final design has not yet been accepted. The most important reprocessing method is described.

61 references, 2 Czech, 53 USA, 1 British, 1 French, 1 Canadian, 2 German, 1 East European.

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CZECHOSLOVAKIA

SRAIER, V. [Affiliation not given]

"Counter Current Extraction in a Laboratory Mixer-Settler II. The Equilibrium Distribution of Uranyl Nitrate and Nitric Acid in Counter-Current with Methylcyclohexanone" [Summaries only]

Prague, Jaderna Energie, Vol 9, No 2, Feb. 1963, pp 59-60.

Abstract [of English summary]: The distribution in a ten stage laboratory mixer-settler from acid and acid deficient aqueous solutions of 5M ammonium nitrate used as salting agent was investigated. Weak acid gives minimum contamination with fission products. In strong acid the organic phase is unstable, so that such an extraction is not practical.

No references.

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CZECHOSLOVAKIA

PETROSYANTS, A.; chairman of the State Committee for the Utilization of Atomic Energy, at the Council of Ministers of the USSR

"Atomic Energy in the Services of the Soviet National Economy." [Czech translation of the Russian original published in Ekonomicheskaya Gazeta, No 45, 1962]

Prague, Jaderna Energie, Vol 9, No 2, Feb. 1963, pp 60-63.

Abstract: The author stresses the importance of the atomic power generation in power station and in ship propulsion. Industrial uses of radioisotopes are mentioned. The use of these isotopes in control and analytical apparatus saved 200 million rubles during 1961 in the USSR. Various industries using such apparatus are mentioned. Importance of these isotopes in biological studies is described. Aspects of safety in their handling are reviewed. Some of their future uses planned in the USSR are listed.
No references.

1/1

CZECHOSLOVAKIA

VYDRA, Milos, Institute for Nuclear Research Czechoslovak Academy of Science, Prague. (Ustav Jaderneho Vyzkumu CSAV).

"Transistor Type Radioactivity Indicator"

Prague, Jaderna Energie, Vol 9, No 2, Feb 1963, pp 64-65.

Abstract: A portable light weight instrument of high sensitivity is described. Previously available portable instruments were not sensitive enough and the sensitive ones were too heavy. Wiring scheme of the apparatus is shown.
2 Figures, no references.

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EAST GERMANY

VON ARDENNE, M., and HEISIG, U., of the Manfred von Ardenne Research Institute (Forschungsinstitut Manfred von Ardenne) in Dresden - Bad Weisser Hirsch.

"A Magnetically-Heated Electron Emission Microscope for Metallurgical Purposes"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 2-17.

Abstract: The device, the theory, construction, operation, and applications of which were described in detail, features a unoplasmatron ion source, an ion stream entry angle of 45 degrees (independent of energy level), possibility of two-pole operation for input into accelerator systems or ion radiators from a high-voltage source, object heating by radiation up to 1600 degrees Centigrade, and modular construction on a horizontal electron-optical bench. The capabilities of the instrument were demonstrated by data and electron micrographs. Thirty references, including 23 German and 7 Western.

1/1

EAST GERMANY

BRAND, U., Diplomaed Physicist, and SCHWARTZE, W., Ph. D., of the Research Station for Ultramicroscopy at Friedrich Schiller University (Forschungsstelle fur Ubermikroskopie der Friedrich-Schiller Universitat) in Jena.

"Model Experiments to Study the Image Formation in the Electron-Mirror Surface Microscope"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 18-25.

Abstract: By employing the model described the deflection of the electrons by the object studied can be conveniently measured. The individual paths are characterized successively by a fine electron beam cluster the reflection of which is observed on a luminescent screen. Various types of object surfaces were investigated and an approximating method for calculation was described. Three references, including 2 German and 1 Western.

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EAST GERMANY

VON ARDENNE, Manfred, Professor, Ph. D., and HEISIG, Ullrich, Diplomaed Physicist, of the Manfred von Ardenne Research Institute (Forschungsinstitut Manfred von Ardenne) in Dresden - Weisser Hirsch.

"Small-Scale Unoplasmatron Ion Source"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 26-31.

Abstract: The discharge mechanism, construction, and operation of a unoplasmatron ion source was described. Optimum operating conditions were established on the basis of tests. The small-scale ion source emits argon ions. At a 1-mA argon ion flow the ionization efficiency degree is 0.15 and the ion yield is approximately 10^{-2} mA W^{-1}. Four references, including 3 German and 1 Western.

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EAST GERMANY

WERNER, Heinz, Diplomaed Engineer, of the People-Owned Enterprise Vakutronik (VEB Vakutronik) in Dresden.

"A Potential Deflection Error in Magnetic Deflecting Systems"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 32-50.

Abstract: Experimental results showed that in addition to errors caused by astigmatism, Coma, and distortion, errors may be caused if part of the scatter flux penetrates iron components adjacent to the magnetic deflection system. These errors can cause undesirable consequences in certain oscillographs and in devices for fabricating by means of the electron stream. Seven references to German publications.

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EAST GERMANY

WORM, Manfred, of the Institute for Physical Technology at the German Academy of Sciences (Physikalisch-Technisches Institut der Deutschen Akademie der Wissenschaften) in Berlin.

"A Method for the Detemination of Radial Density and Temperature Distribution in High-Pressure Xenon Discharge"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 51-61.

Abstract: The radial density and temperature distribution is measured by determining the weakening of X-ray radiation through the discharge. The X-rays are generated by cadmium sulfide cells in compensation circuit. By a twofold difference setup it is possible to calibrate scale readings directly for density and temperature data. Eight references to German publications.

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EAST GERMANY

ECKARDT, A., Professor, Ph. D., GOTZ, G., Diplomaed Physicist, MITTENBACHER, J., Diplomaed Physicist and PRAGER, R., Diplomaed Physicist, of the Institute for Technical Physics No 1 at Friedrich Schiller University (Technisch-Physikalisches Institut I der Friedrich-Schiller Universitat) in Jena.

"Waviness Measurements on a Cascade Generator by Means of (p-Gamma)-Reactions"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 62-66.

Abstract: By measuring the gamma-intensity in (p-gamma)-reactions as a function of time it is possible to determine the waviness of the initial tension in cascade generators. This method also facilitates the operation of (and increases the energy resolving ability of) the attached accelerating system. Three references to German publications.

1/1

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EAST GERMANY

SCHRECKENBACH, M., Ph. D., of the Institute for Applied Physics on Pure Substances at the German Academy of Sciences (Institut fur Angewandte Physik der Reinstoffe der Deutschen Akademie der Wissenschaften) in Dresden.

"Devices for Handling Thin Crystal Needles and Other Small Objects Under the Microscope"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 67-74.

Abstract: Two ball-stages are described which enable the convenient and safe handling of small objects such as thin crystal needles for examinations under the microscope. Construction details are provided. One reference to a German publication.

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EAST GERMANY

HEDRICH, H.H., and WILKE, K.-Th., Ph. D., of the Institute for Physical Technology; Specialty Field: Radiation Sources, at the German Academy of Sciences (Physikalisch-Technisches Institut der Deutschen Akademie der Wissenschaften, Bereich Strahlungsquellen) in Berlin.

"A Simple Temperature Regulator for Growing Crystals from Melts"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 75-76.

Abstract: Schematic diagram and construction details are provided for a simple temperature regulator which enables initial temperatures of up to 1100 degrees Centigrade to decrease uniformly at a rate of five to 50 degrees Centigrade per hour. The apparatus was used with success in growing crystals from melts. No references.

1/1

EAST GERMANY

BOLLINGER, H., and PETZOLD, Kl., Diplomaed Physicist, of the Institute for Instrument Construction at the German Academy of Sciences (Institut fur Geratebau der Deutschen Akademie der Wissenschaften) in Berlin.

"[The Use of]Dibutyl Phthalate with Small Amounts of Ditertiarybutyl Paracresol Added as Diffusion Pump Propellant"

Jena, Experimentelle Technik der Physik, Vol 11, No 1, 1963, pp. 77-80.

Abstract: Dibutyl phthalate can be used as propellant in diffusion pumps in which there is no appreciable amount of water vapor present. The pumping rate of diffusion pumps using this propellant is higher than that of those using mineral oil. There are practically no deleterious decomposition products. Saponification is effectively prevented by using ditertiarybutyl paracresol in admixture with the dibutyl phthalate. No references.

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EAST GERMANY

SACHSE, G., and MITTAG, I., of the Central Institute for Nuclear Physics, Specialty Field: Nuclear Chemistry (Zentralinstitut fur Kernphysik, Bereich Radiochemie) in Rossendorf bei Dresden.

"Methods for Processing Radioactive Effluents"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 1-11.

Abstract: This summarizing article reviews the methods used for processing radioactive effluents in the United States, Canada, Great Britain, Denmark, and the USSR. The methods used include chemical and physical processes. The distillation method employed in the Riso, Denmark, installation were described in more detail. Thirty-five references, including 1 German, 1 Russian, and 33 Western.

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EAST GERMANY

MEYER, K., of the People-Owned Enterprise for the Development and Planning of Nuclear Technological Installations (VEB Entwicklung und Projektierung Kerntechnischer Anlagen) in Berlin.

"An Application of the Slowing-Down Theory in Studies on the Problems Connected with Fuel Burnup in Reactors"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 12-20.

Abstract: A method was described to study the effects of operating conditions on the fuel burnup in a nuclear reactor. The method yields an integral equation which was solved by the Greuling-Goertzel theorem known from the field of neutron slowing-down. Examples were given for two different methods of operation and the practical utilization of the information obtained was elucidated. Five references, including 2 German and 3 Western.

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EAST GERMANY

MULLER, A., of the People-Owned Enterprise for the Development and Planning of Nuclear Technological Installations (VEB Entwicklung und Projektierung Kerntechnischer Anlagen) in Berlin.

"Theoretical Problems Connected with the Peaking of Power Density of Water Gaps in Pressurized Water Reactors"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 20-28.

Abstract: After a brief description of the neutron physical factors involved, conventional and improved methods of calculation were reviewed and the results compared with experimental findings. Approximating methods were considered to be of greatest interest. Correlation between calculated and experimentally determined data was unsatisfactory and further investigation is desirable to establish the causes of the deviations observed. Twenty-two references, including 6 German and 16 Western.

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EAST GERMANY

CERMAK, J., of the Institute for Nuclear Research at the Czechoslovakian Academy of Sciences [original-language version not given] in Prague, Czechoslovakia.

"Calculation of the Efficiency of a Partially-Inserted Eccentric Control Rod in a Cylindrical Reactor"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 28-30.

Abstract: By employing the method of calculation described by CERMAK, J., and TRLIFAJ, L. (Kernenergie, Vol 4, 1961, pp. 497 et seq.) the change in neutron flux density in the vicinity of the control rod could be approximated. The procedure was explained on the basis of an example involving a partially-inserted eccentric control rod in a cylindrical reactor. Three references, including 2 Czechoslovakian and 1 Western.

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EAST GERMANY

SCHURIG, Ch., SPINDLER, H., and STEINKOPF, H., of the Central Institute for Nuclear Physics; Specialty Field: Materials of Construction and Solids (Zentralinstitut fur Kernphysik, Bereich Werkstoffe und Festkorper) in Rossendorf bei Dresden.

"Preparation of Fuel Elements by Swaging of Uranium Dioxide"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 31-37.

Abstract: Uranium dioxide, in the form obtained from conventional manufacturing processes, is not suitable for fabrication by means of swaging. Presintering of the uranium dioxide results in a form suitable for this process. Satisfactory particle size distribution and densities up to 94% could be achieved. By employing thin-wall tubes in the swaging operation, the obtainable densities could be further increased. Nine references to Western publications.

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EAST GERMANY

NIESE, S., MORZEK, P., and HEROLD, C., of the Central Institute for Nuclear Physics; Specialty Field: Nuclear Chemistry (Zentralinstitut fur Kernphysik, Bereich Radiochemie) in Rossendorf bei Dresden.

"Determination of Yield in the Ti(n,p)Sc and Ge(n,α)Zn Treshold Reactions in Water-Moderated, Water-Cooled Reactors"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 37-39.

Abstract: By employing an absolute method based on gamma spectrometry the following capture cross sections were determined for the WWR-S reactor in Rossendorf: Ti-46(n,p)Sc 1 $\pm$ 3 megabarn; Ti-47(n,p)Sc-47 18 $\pm$ 3 megabarn; Ti-48(n,p)Sc-48 0.44 $\pm$ 0.08 megabarn; Ge-72(n,α)Zn-69m 0.020 $\pm$ 0.005 megabarn; and Ge-74(n,α)Zn-71m 0.002 $\pm$ 0.001 megabarn. Six references, including 1 German and 5 Western.

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EAST GERMANY

KOCH, H., and SCHMIDT, H., of the Institute for Applied Radioactivity (Institut fur Angewandte Radioaktivitat) in Leipzig.

"Separation of Polonium from Irradiated Bismuth by Means of an Ion Exchanger"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 39-42.

Abstract: The irradiation products were dissolved in concentrated hydrochloric acid and treated with ion exchangers such as Wofatit SbU or Amberlit XE 98. They were then eluted with concentrated hydrochloric acid until no further beta- or gamma-radiation was evident. The polonium remained on the surface of the ion exchanger; it was eluted subsequently with a 1:1 nitric acid or a 1:1 perchloric acid solution, respectively, from the two ion exchangers mentioned. The eluted polonium solution was free from inactive bismuth. Five references, including 1 German, 1 Japanese, and 3 Western.

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EAST GERMANY

GERSCH, H.-U., and LANG, G., of the Central Institute for Nuclear Physics; Specialty Field: Reactor Technology and Neutron Physics (Zentralinstitut fur Kernphysik, Bereich Reaktortechnik und Neutronenphysik) in Rossendorf bei Dresden.

"Automatic High-Voltage Control for Geiger-Muller Counters"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 42-45.

Abstract: The automatic control system developed for counters in a magnetic spectrometer enabled the counter to be driven at optimum range under drifting conditions. An experimental evaluation of the system indicated an accuracy of approximately 10 volts in the impulse density range of 1000 impulses per minute. The schematic diagram of the system is shown. One reference to a German publication.

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EAST GERMANY

LEONHARDT, W., of the Central Institute for Nuclear Physics; Specialty Field: Radiochemistry (Zentralinstitut fur Kernphysik, Bereich Radiochemie) in Rossendorf bei Dresden.

"Determination of Fluorine Traces by Activation in the Reactor"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 45-46.

Abstract: The determination of fluorine traces in electrolytically refined titanium was described. The samples were encapsulated with ammonium bifluoride standard and irradiated in the reactor core. The irradiated samples were then dissolved, the fluorine precipitated in the form of calcium fluoride and its activity determined by conventional techniques. Eleven references, including 3 German and 8 Western.

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EAST GERMANY

HEROLD, C., [affiliation not given].

"Methodology of Radiophysics and Radiochemistry - by L. Herforth and H. Koch"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, p. 46.

Abstract: This article is a review of the German book entitled "Methodology of Radiophysics and Radiochemistry" (Radiophysikalisches und Radiochemisches Praktikum) by HERFORTH, L., and KOCH, H.; published in 1962 by the People-Owned Enterprise for German Publishing for the Sciences (VEB Deutscher Verlag der Wissenschaften) in Berlin. This is the second, revised edition; it has 550 pages and 205 illustrations. Price is DM 29.20.

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EAST GERMANY

LOSCHE, A., [affiliation not given].

"Tables for Applied Physics; Vol 1: Electron Physics, Ultramicroscopy, and Ion Physics - by M. von Ardenne"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, pp. 46-47.

Abstract: This article is a review of the German book entitled "Tables for Applied Physics; Vol 1: Electron Physics, Ultramicroscopy, and Ion Physics" (Tabellen zur Angewandten Physik, Band I: Elektronenphysik, Ubermikroskopie, Ionenphysik), published in 1962 by the People-Owned Enterprise for German Publishing for the Sciences (VEB Deutscher Verlag der Wissenschaften) in Berlin. The book has 758 pages; price is DM 140.00. VON ARDENNE, M., is the Editor.

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EAST GERMANY

SUBE, R., [affiliation not given].

"Technical Encyclopedia, Vol 2: Principles of Electrical Technology and Nuclear Technology - by Lueger"

Berlin, Kernenergie, Vol 6, No 1, Jan 1963, p. 47.

Abstract: This article is a review of the German book entitled "Lueger's Technical Encyclopedia, Vol 2: Principles of Electrical Technology and Nuclear Technology" (Lueger, Lexikon der Technik, Band 2: Grundlagen der Elektrotechnik und Kerntechnik) published by the German Publishing Establishment (Deutsche Verlags-Anstalt) in Stuttgart, 1960. The book has 624 pages and covers 1793 terms; it is priced at DM 180.00.

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