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## SODIUM IODIDE AND SODIUM IODIDE CRYSTALS: THEIR USE IN SCINTILLATION COUNTING AND SPECTROMETRY

A Bibliography

Prepared by

Robert R. Kepple

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The arrangement is alphabetical by title, and personal author and subject indexes are included.

1. ABSORPTION MEASUREMENTS WITH COBALT-60 GAMMA RADIATION. L. Keszthelyi. Acta Phys Acad Sci. Hung. 5, 269-74 (1955) (in English)

CA56-9168f

The absorption of $Co^{60}$ gamma radiation is measured for a series of crystals. The absorption coefficient in units of sq. cm/g for NaI is 0.0514 ± 0.0002.

2. ABSORPTION OF GAMMA RADIATION IN NaI WELL CRYSTALS. M. H. Wachter, W. H. Ellett, and G. L. Brownell. Rev. Sci. Instr 31, 626-30 (1960) June

NSA60-18013

3. ABSORPTION OF MEDIUM HIGH-ENERGY GAMMA RAYS IN SODIUM IODIDE (THALLIUM) SCINTILLATOR. C. Ishii, et al. Sci. Repts. Tohoku Univ. First Ser. 42, No. 1, 7-15 (1958)

CA59-16732a

4. ALKALI HALIDE SCINTILLATION COUNTERS. R. Hofstadter. Phys. Rev. 74, 100-101, July 1, 1948.

NSA48-660

NaI powder with added Tl appears to be an even more efficient phosphor than ZnS (Silver) for the detection of alpha particles; NaI was also used successfully in the detection of radium gamma rays.

5. ALKALI HALIDE SCINTILLATORS. W. Van Sciver. IRE Trans. on Nuclear Sci. NS-3, No. 4, 39-50 (1956)

CA57:4833f

Spectra of the luminescence from unactivated NaI and NaI(Tl) have been measured from -190 to +20° with alpha particles, gamma rays and ultraviolet light as excitation sources. The characteristic emission from NaI is in a band centered at approx. 300m$\mu$ and for NaI($10^{-3}$ Tl) at approx. 420m$\mu$.

6. ALPHA-PULSE ANALYSIS BY SCINTILLATION DETECTORS. G. Bertolini, et al. Centro di Studi Nucleari, Ispra. Dec. 1959.

NSA60-13838

7. ANALYSIS OF GAMMA RAY ENERGY. H. Matsushita. Oyo Butsuri 27, 435-9 (1958)

CA58-19541h

The use of NaI(Tl), its crystal size, and transparency are described.

8. ANALYSIS OF GAMMA RAY SCINTILLATION SPECTRA FOR QUANTITATIVE PHOTON INTENSITIES. N. H. Lazar. IRE Trans. Nuclear Sci. NS-5, 138-46 (1958) Dec.

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9. ANALYSIS OF SINGLE CRYSTAL PULSE-HEIGHT DISTRIBUTIONS. H. M. Childers. Rev. Sci. Instr 30, 810-14, Sept. 1959.

10. AN ANALYSIS OF THE BACKGROUND RADIATION DETECTED BY NaI CRYSTALS. C. E. Miller, L. D. Marinelli, R. E. Rowland, and J. E. Rose. IRE Trans. Nuclear Sci. NS-3, No. 4, 90-6, (1956) Nov.
NSA57-4583

11. ANGULAR CORRELATION AND ANGULAR DISTRIBUTION ATTENUATION COEFFICIENTS. A. L. Stanford, Jr. and W. K. Rivers, Jr. Rev. Sci. Instr 30, 719-21, Aug. 59.

12. ANGULAR CORRELATION CORRECTION FACTORS VIA THE METHOD OF ROSE. H. I. West, Jr. Calif. Univ., Lawrence Radiation Lab. Jan 6, 1959. UCRL-5451.
NSA59-11982

13. ANGULAR DEPENDENCIES OF EFFICIENCIES FOR SODIUM-IODIDE CRYSTALS. T. Doke, et al. J. Phys. Soc. Japan 15, 737-8 (1960) Apr. (in English)
NSA60-14197

14. ANNUAL PROGRESS REPORT (COVERING) RESEARCHES DURING THE PERIOD JUNE 1, 1957 TO MAY 31, 1958. Rept. No. 53. Mass. Inst. of Tech. Cambridge Lab. for Nuclear Science. AECU-3908, p. 92-97
NSA59-3468

Description of a fast NaI spectrometer with good energy resolution constructed in connection with the program of investigation of isomeric states by pulsed beam techniques.

15. APPLICATION OF A SYSTEM: PHOTO FILM-SCINTILLATING CRYSTAL FOR REGISTRATION OF GAMMA RADIATION. R. M. Kogan and N. K. Pereyaslova. Pribory i Tekh. Ekspt. 1957, No. 4, 25-7.
CA58-6967d

The sensitivity of the system; photo film-scintillating crystal NaI(Tl) in dosimetry of gamma radiation is $10^3$-$10^4$ higher than with use of the photo film alone.

16. APPLICATION OF ELECTRON MULTIPLIERS FOR COUNTING OF ELEMENTARY PARTICLES AND QUANTA. T. M. Lifshits. Uspekhi Fiz Nauk 50, 365-432 (1953) A review.
CA54-3785i

The average amplification of photomultipliers is discussed, and the optimum conditions for counting are delineated. The construction of photomultipliers and the properties of luminescent crystals (NaI:Tl etc.) are discussed as well as circuits and applications for counting light quanta, cosmic radiation, neutrons and positive ions.

17. APPLICATION OF RADIOACTIVE ISOTOPES TO THE PURIFICATION OF INORGANIC SALTS BY CRYSTALLIZATION AND PRECIPITATION METHODS. G. I. Gorshtein and N. I. Silant'eva. Trudy Vsesoyuz. Nauch.-Tekh. Konf. po Primenen. Radioaktiv. i Stabil. Izotopov i Izluchenii v Narod. Khoz. i Nauke, Izotopy i Izlucheniya v Khim. 1957, 203-10 (Pub 1958)

CA59-21331d

The method was used for the preparation of pure NaI for scintillation crystals.

18. AN APPLICATION OF THE SCINTILLATION SPECTROMETER WITH SODIUM IODIDE AND ANTHRACENE PHOSPHORS. R. J. Kerr. Univ. Microfilms Publ. No. 9934, Dissertation Abstracts 14, 2098-9 (1954)

CA55-3671d

19. ATOMIC ENERGY INSTRUMENTATION. C. D. Florida and W. R. Loosemore. Atomics (London) 3, No. 3, 67-75 (1952)

CA52-8980g

A summary of the conference at Harwell. It was reported that a seed crystal held in a water-cooled chuck in an atm of N facilitated growth from a mixture of molten Na and Tl iodides. Tl-activated NaI crystals are well adapted to beta and gamma ray determinations by the scintillation method.

20. ATTEMPT TO USE A PURE NaI CRYSTAL AS A FAST COINCIDENCE GAMMA DETECTOR. M. Vergnes and R. David-Boyer. J. Phys. Radium 21, 65-7 (1960)

CA60-8324i

21. BASIC PROPERTIES OF SCINTILLATION DETECTORS WITH NaI(Tl) CRYSTALS. J. Silar and O. Novakova. Jaderna Energie 4, 122-7 (1958)

CA58-18000e

22. BREMSSTRAHLUNG DETECTION BY A SCINTILLATOR FOR SIMPLIFIED BETA COUNTING. R. Loevinger and S. Feitelberg. Nucleonics 13, No. 4, 43-5 (1955)

CA55-9391g

A description is given of a well-type NaI crystal for assaying $P^{32}$ with an efficiency of 0.8 count/100 disintegrations. With a sample activity of 7 millimicrocurie/cc. and 1-5 ml of sample, equal accuracy with Geiger-Muller counting is obtained.

23. BREMSSTRAHLUNG SPECTRA IN AN INFINITE SODIUM IODIDE CRYSTAL. C. D. Zerby and H. S. Morgan. Aug. 18, 1959. Oak Ridge National Lab. ORNL-2754.

NSA59:19460

24. BREMSSTRAHLUNG SPECTRA IN NaI AND AIR. C. D. Zerby and H. S. Morgan. Mar. 11, 1958. Oak Ridge National Lab. ORNL-2454.
NSA58-6686

25. BURSTS IN NaI(Tl) NEAR SEA LEVEL. S. Standil. Phys. Rev. 96, 777 (1954) Nov. 1
NSA55-676
The spectrum of cosmic-ray events induced in a NaI(Tl) scintillation spectrometer has been observed near sea level. The high-energy bursts so observed are interpreted as due mainly to nuclear interactions in the crystal with an energy distribution given by the power law $N(E)dE \propto E^{-3.6}dE$.

26. CALCULATED EFFICIENCIES OF CYLINDRICAL RADIATION DETECTORS. S. H. Vegors, Jr. et al. Sept. 1, 1958. Phillips Petroleum Co. Atomic Energy Div., Idaho Falls. IDO-16370.
NSA59-731

27. CALCULATED EFFICIENCIES OF NaI CRYSTALS. E. A. Wolicki, et al. Aug. 27, 1956. Naval Research Lab. NRL-4833.
NSA57-488

28. CALIBRATION OF A SCINTILLATION SPECTROMETER FOR THE COMPARISON OF GAMMA AND X RAY INTENSITIES. B. Astrom et al. Arkiv Fysik 7, 247-53 (1953)
CA54-10442h

29. CALIBRATION OF AN 8" x 8" SODIUM IODIDE (Tl) CRYSTAL. W. L. Weiss. Mar. 24, 1960. General Electric Co. Aircraft Nuclear Propulsion Dept. XDC-60-3-212
NSA60-19582

30. CHEMICAL ENGINEERING DIVISION QUARTERLY REPORT FOR APRIL, MAY, JUNE 1956. Argonne National Lab. ANL-5602, p. 128-129
NSA57-13582
Using a 4 x 4 in. diam. cyl. crystal mounted in a lead housing, the total efficiency was determined.

31. CHEMISTRY DIVISION SUMMARY REPORT FOR JANUARY THROUGH JUNE, 1953. J. R. Gilbreath et al. Argonne National Lab. ANL-5451.
NSA54-6868
The scintillation response of NaI to photons and LiF to deuterons is studied.

32. COLOR CENTERS IN ALKALI HALIDE CRYSTALS. M. C. R. Symmons and W. T. Doyle. Quarterly Revs. (London) 14, No. 1, 62-76 (1960)
CA60-12787i

A review with 75 references.

33. COMPACTED SCINTILLATORS. L. Reiffel and H. V. Watts. Phys. Rev. 97, 1714 (1955)
CA55-7985h

Activated microcryst. powders were compacted under pressures of ~100,000 lb/sq in. NaI(Tl) gave 35-85% of the single crystal pulse height.

34. CONFIGURATION INTERACTION IN ALKALI HALIDE PHOSPHORS. R. S. Knox. Phys. Rev. 115, No. 5, 1095-106 (Sept. 1, 1959)
SA60-1758

It is shown that excited-state wave-functions of free activator ions do not provide a completely adequate basis for a quantitative theory of the luminescence of alkali halides activated by heavy metals. It is proposed that better zero-order wave functions may be obtained by allowing interaction between different types of states of excitation and as a practical example of an electronic configuration which can interact with excited activator configurations, the electron transfer states of the Seitz model are discussed in detail.

35. COSMIC RAY GROUP: ELEMENTARY PARTICLE SCATTERING GROUP; AND NEUTRON PHYSICS GROUP. p. 53-75 of annual progress report no. 33 for period June 1, 1953 to May 31, 1954. (AECU-2943 p. 53-75)
NSA54-7042

The inelastic scattering of neutrons by the NaI(Tl) crystal was studied.

36. COUNTING EFFICIENCIES FOR SODIUM IODIDE CRYSTALS. P. W. McLaughlin and G. D. O'Kelley. Sept. 1953. Livermore Research Lab., Calif. Research and Development Co. MTA-40
NSA53-6160

37. THE CROSS-SECTIONS FOR SOME NUCLEAR REACTIONS INDUCED BY 14 Mev NEUTRONS IN NaI:Tl, KI:Tl, CsI:Tl and $Li^6I$:Eu SCINTILLATOR CRYSTALS. M. Bormann et al. Z. Naturforsch 15a, No. 3, 200-10 (March, 1960) In German.
SA60-13289

The high detection efficiency of self-induced reactions in scintillator crystals is made use of to determine the cross-sections for some reactions initiated by 14 Mev neutrons.

38. CRYSTALLIZATION FROM MELTS. O. Kovacevic. Tehnika 10, 245-51 (1955)

CA58-825f

Methods are reviewed and some experiences with the crystn. of monocrystals from naphthalene-anthracene and NaI (contg. 1% TlI) melts are reported.

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CA51-2320d

Newly examined ultraviolet scintillators for alpha particles are listed in the order of response.

40. DECAY OF COPPER - 67. W. Beusch et al. Helv. Phys. Acta 30, 268-9 (1957)

CA58-9804h

The detector for gamma radiation was a crystal of NaI, 38 mm in diam and in length.

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CA59-21231f

42. THE DEPENDENCE OF THE GAMMA AND PHOTOLUMINESCENCE OF NaI CRYSTALS ON THE THALLIUM CONCENTRATION. L. M. Belyaev et al. Soviet Research in Physics 1956, 1-4 (Engl. translation)

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43. DESIGN CALCULATIONS FOR NaI SYSTEMS. W. F. Miller and W. J. Snow. Rev. Sci. Instr. 31, 905-7 (1960) Aug.

NSA60-23089

The effects of the size of cylindrical NaI(Tl) crystals on its resolution for narrowly collimated gamma beams were calculated by a Monte Carlo computer program for 12 crystals of varying size from 4 x 4 in. to 12 x 24 in. with a 0.5 in. dia gamma beam.

44. THE DETECTION OF ALPHA RAYS BY SINGLE CRYSTALS OF THALLIUM ACTIVATED SODIUM IODIDE. E. G. Michaelis. Helv. Phys. Acta 23, 154-60 (1950)

NSA50-4958

45. THE DETECTION OF GAMMA RAYS WITH THALLIUM ACTIVATED SODIUM IODIDE CRYSTALS. R. Hofstadter. Phys. Rev. 75, 796-810 (1949) March 1

NSA49-1638

46. DETECTION OF LOW ENERGY NEUTRONS WITH A NaI(Tl) CRYSTAL AND TIME OF FLIGHT. R. Ballini and S. M. Shafroth. Nuclear Instr. and Methods 6, 331-6 (1960) Mar. (In English)
NSA60-12732

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NSA3-1150 (1949)

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CA54-4307g

49. DIRECTIONAL SCINTILLATION DETECTOR AND ITS USE IN MEDICINE. J. Silar. Jaderna Energie 3, 25-9 (1957)
CA1960-9526i
This instrument is used for mapping the distribution of radioactivity over a surface or, with several channels and a focussing arrangement, also its distribution in depth.

50. THE EFFECT OF MAGNETIC FIELDS ON THE RESPONSE OF GAMMA SCINTILLATION COUNTERS. J. D. Graves. Phys. Rev. 78, 309-10 (1950)
CA50-7157g

51. THE EFFECT OF TEMPERATURE UPON THE RESPONSE OF A GAMMA RAY SCINTILLATION SPECTROMETER. L. A. Webb. Naval Radiological Defense Lab., May 11, 1955. USNRDL-TR-48
NSA55-7456

52. THE EFFECT OF TEMPERATURE UPON THE SCINTILLATION EFFICIENCY OF NaI(Tl). L. A. Webb and R. F. Johnson. Phys. Rev. 98, 234. (1955).
CA56-10511c

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NSA56-2114

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CA59-15800e

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CA58-6964f

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CA59-12041g (1958)

57. ELASTIC CONSTANTS BY THE ULTRASONIC PULSE ECHO METHOD, SINGLE-CRYSTAL KCl and NaI. S. Eros and J. R. Reitz. J. Ap. Phys. 29, 683-6. April, 1958.

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SA56-8236

Tabulations of the mean energy loss due to ionization and excitation and the range derived from this quantity are given for electrons and positrons in various materials.

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SA53-947

61. ENERGY LOSS SPECTRA FOR GAMMA RAYS IN NaI. W. F. Miller and W. J. Snow. Rev. Sci. Instr. 31, 39-45 (1960) Jan.
NSA60-7593

62. ENERGY RESPONSE OF NaI(Tl) CRYSTALS TO ALPHA PARTICLES OF LESS THAN 10 Mev. R. H. Lovberg (nd) Los Alamos Scientific Lab. AECU-1638, LADC-1046, also Phys. Rev. 84, 852 (1951)
NSA51-6310

63. ESCAPE PEAK CORRECTION FOR NaI(Tl) CRYSTALS. W. E. Meyerhof and H. I. West, Jr. Rev. Sci. Instr. 25, 1025 (1954)
CA55-12107b

64. ESCAPE PEAK CORRECTION TO GAMMA-RAY INTENSITY MEASUREMENTS MADE WITH SODIUM IODIDE CRYSTALS. P. Axel. Brookhaven National Lab. BNL-271.
NSA54-1961

65. EXPERIMENT ON THE UTILIZATION OF A PURE NaI CRYSTAL AS GAMMA DETECTOR IN RAPID COINCIDENCE. M. Vergnes and R. David-Boyer. J. Phys. Radium, 65-7 (1960) Jan. (In French)
NSA60-10627

The possible utilization of pure NaI crystals in a fast coincidence system as gamma detectors for low-energy photons is investigated. The results show no significant improvement from the utilization of pure NaI crystals.

66. AN EXPERIMENT TO APPLY LUMINESCENCE COUNTERS TO THE REGULATION OF X-RAY SPECTRA. L. M. Belyaev, et al. Izvest Akad. Nauk S.S.S.R., Ser. Fiz. 20, 801-8 (1956) Bull. Acad. Sci. U.S.S.R. Phys. Ser. 20, 727-33 (1956) (English Translation)
CA57-1727e

67. EXPERIMENTAL DATA OBTAINED BY LUMINESCENCE METHOD OF GAMMA RADIATION DOSIMETRY. I. E. Konstantinov. Issledovaniza v Oblasti Dozimetrii Ioniziruyushchikh Izluchenii, Sbornik Statei 1957, 98-101 (Translated from Referat. Zhur. Elektrotekhn. No. 2, 1959, p. 151-2
NSA59-22299

Examination of the hardness course in luminescent crystals of NaI(Tl) is described. The minimum gamma-radiation dose rate that can be measured by the luminescent method was determined for a NaI(Tl) crystal. Feasibility of constructing a luminescent gamma-radiation dosimeter for measuring a dose rate of $10^{-9}$ roentgen/sec is noted.

68. EXPERIMENTAL INVESTIGATION OF SCINTILLATION COUNTER EFFICIENCY. V. P. Bovin. Atomnaya Energ 8, 155-8 (1960) Feb. (In Russian)
NSA60-11750

69. FAST COINCIDENCE AND GAMMA-GAMMA SPECTROSCOPY WITH A SODIUM IODIDE SCINTILLATION COUNTER: APPLICATION TO RHODIUM-102. I. L. Dick et al. Compt. Rend. 240, 1335-7 (1955)
CA55-12982i

70. FAST SODIUM IODIDE SPECTROMETER AND ITS APPLICATION TO MILLIMICROSECOND TIME MEASUREMENT. L. E. Beghian et al. Rev. Sci. Instr. 29, 753-7, Sept. 1958.

71. FIELD RADIOMETER Sg 42. M. M. Sokolov and N. I. Karabanov. Izvest. Akad. Nauk S.S.S.R., Ser. Fiz. 22, 88-9 (1958)

CA58-6965e

A portable battery fed installation with a NaI-Tl crystal and having a threshold sensitivity of 2$\mu$/hr (180-200 pulses/min/1$\mu$/hr) is described.

72. FINITE GEOMETRY CORRECTIONS TO GAMMA-RAY ANGULAR CORRELATIONS MEASURED WITH 5 IN. DIAMETER BY 4 IN. LONG NaI(Tl) CRYSTALS. H. E. Gove and A. R. Rutledge. Atomic Energy of Canada, Ltd., Chalk River Project. Feb., 58. CRP-755

NSA58-10804

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NSA60-2793

74. FLUORESCENCE DECAY TIME IN Tl-ACTIVATED INORGANIC SCINTILLATION CRYSTALS FOR PARTICLES OF VARIOUS IONIZATION DENSITY. M. Bormann et al. Z. Naturforsch. 14a, 681-3 (1959) July (In German)

NSA59-21132

75. FLUORESCENCE EFFICIENCIES OF SOME CRYSTALS FOR ELECTRONS AND HEAVY PARTICLES. W. K. Jentschke et al. Phys. Rev. 83, 170-1 (1951)

CA51-8902i

The fluorescence of anthracene, stilbene, and Tl-activated NaI crystals with incident pulsed monoenergetic electrons was examd. NaI(Tl) has a linear response, 1000 e.v. to 624 e.Kv. but there are indications of a small deviation from linearity below 1000 e.v.

76. FLUORESCENCE OF GASES EXCITED BY HIGH-ENERGY CHARGED PARTICLES. L. Koch and R. Lesueur (Centre etude nucl., Saclay, France). Proc. Intern. Conf. Ionization Phenomena Gases, 3rd., Venice, 1957. 534-43 (In French).

CA58-16034e

The fluorescence of Ar, Kr, Ke, He, and $N_2$ is compared with that of tetraphenylbutadiene and NaI(Tl) scintillators. The addn. of N to Ar initially increases, then rapidly decreases, the fluorescence intensity.

77. FLUORESCENT RESPONSE OF NaI(Tl) TO NUCLEAR RADIATIONS. F. S. Eby and W. K. Jentschke (Univ. of Ill.). Phys. Rev. 96, 911-20 (1954) Nov. 15.

78. THE FREQUENCIES AND THE ANHARMONICITIES OF THE NORMAL MODES OF OSCILLATION OF ALKALI HALIDE CRYSTALS. I. Lattice oscillations. K. S. Krishnan and S. K. Roy. (Natl. Phys. Lab., New Delhi, India). Proc. Royal Soc., (London) A207, 447-60 (1951).
CA52-315g

79. FUNDAMENTAL STUDIES OF SCINTILLATION PHENOMENA IN NaI. W. J. Van Sciver and L. Bogart. (Levinthal Electronic Products, Inc. Palo Alto, Calif.) IRE Trans., Nuclear Science NS5, 90-2 (1958) Dec.
NSA59-3755

Work on pure NaI reported at the Fifth Scintillation Counter Symposium (1956) has been extended using crystals of higher purity at temperatures down to 4°K.

80. FUNDAMENTAL STUDIES ON SCINTILLATION PHOSPHORS: QUARTERLY REPORT FOR PERIOD SEPT. 1952 TO DEC. 1, 1952. L. Reiffel and R. F. Humphreys. Jan. 26, 1953. 32 p. Armour Research Foundation (NP 4611; Quarterly Report 2; Technical Report 1).
NSA53-4633

In a study of afterglow it was found that, in addition to very short-lived traps in NaI(Tl), there exist at least two long-lived groups ranging in lifetime from 60 sec. to perhaps 100 min. Most if not all characteristics of the afterglow of NaI(Tl) can be accounted for by the shallow trap-deep model of phosphorescent materials. The long-lived traps contribute a spectral shift away from the fluorescence wavelengths that increases in magnitude with time after excitation. Partial optical discrimination against afterglow is possible. Quenching of some afterglow components should be possible. The very long-lived afterglow probably is associated with F-center formation and subsequent bleaching.

81. GAMMA COUNTING EFFICIENCY OF TWO WELL-TYPE NaI CRYSTALS. R. Baskin et al. Nucleonics 12, No. 8, 46-8 (1954) Aug.
NSA54-5914

82. GAMMA-RAY ABSORPTION COEFFICIENTS AT 6.13 Mev. R. S. Paul. Mar. 12, 1954. Hanford Works (HW-31123). Phys. Rev. 96, No. 6, 1563-5 (Dec. 15, 1954)
NSA54-4431

Narrow beam geometry attenuation measurements have been made with the 6.13-Mev $\gamma$ rays from $N^{16}$ using a NaI scintillation spectrometer detector. The measured absorption coefficients in $cm^2/gm$ are:..., 0.0350 (NaI). The statistical standard deviations range from 0.2% to 0.4%.

83. GAMMA-RAY ABSORPTION COEFFICIENTS FOR NaI, Cu, Ta, AND W. P. R. Howland and W. E. Kregar (U.S. Naval Radiological Defense Lab., San Francisco, Calif.) Phys. Rev. 95, 407-10 (1954) July 15.

NSA54-5394

Gamma-ray absorption coefficients have been measured over a range of energies from 0.279 Mev through 1.113 Mev for NaI, Cu, Ta and W; using an energy selective scintillation detector.

84. γ-RAY DOSIMETRY WITH ORGANIC SCINTILLATORS. R. T. Carrand, G. J. Hine. (Mass. Inst. of Tech.) Nucleonics 11, No. 11, 53-5, 68 (1953).

CA54-4991b

Anthracene (I) and NaI scintillators were used with com. photomultiplier tubes to attain air-equiv. dosage measurements for γ-ray emitters. For γ rays between 0.6 and 2.0 Mev the value of I/D remained nearly const. for a 2.5 cm NaI crystal since Compton absorption predominates over photoelec. and pair-production attenuation in this energy region.

85. GAMMA-RAY ENERGY RESOLUTION WITH NaI-TlI SCINTILLATION SPECTROMETERS. C. J. Borkowski and R. L. Clark. Rev. Sci. Instr. 24, 1046-50 (1953) Nov.

NSA54-1163

86. γ-RAY MEASUREMENTS WITH NaI(Tl) CRYSTALS. R. Hofstadter and J. A. McIntyre. (Princeton Univ.). Phys. Rev. 79, 389-91 (1950).

CA50-8783e

87. GAMMA-RAY RESOLUTION OF LARGER NaI(Tl) SCINTILLATORS. R. L. Hickok and J. E. Draper. R. Sci. Instr. 29, 994-9 (1958).

88. γ-RAY SPECTROSCOPE USING A SCINTILLATING CRYSTAL. R. Sternheimer. Brookhaven National Lab. Oct. 11, 1951. AECU-2982.

NSA55-1597

89. γ-RAY SPECTROSCOPY WITH CRYSTALS OF NaI(Tl). R. Hofstadter and J. A. McIntyre. Nucleonics 7, No. 3, 32-7 (1950).

CA51-1876g

90. GAMMA-SPECTROMETER WITH ANTICOINCIDENCE SHIELDING. D. Maeder and R. Muller. Helv. Phys. Acta 29, 446-8 (1956)
CA57-17488f

A thin wall Al vessel contained a crystal of NaI(Tl) 13 cm. in diam. and 10 cm. high. It was surrounded by 50ℓ of xylene contg. 4 g. terphenyl/l and 0.01 g. diphenylhexatriene/l. The inner walls of the vessel were coated with an evapd. film of MgO for increased reflection. Without the shielding soln., the intensity ratios were 10:5:1 for the primary, and 2 secondary rays from $Co^{60}$; with the soln., the ratios were 10:1:0.

91. GAMMA-TRANSITIONS OF CERTAIN LIGHT NUCLEI. T. Muller. Ann. Phys. (13) 3, 739-800 (1958)
CA59-8859g

Several exptl. devices were developed: gaseous target, a device for resolving gamma coincidences by means of 2 NaI(Tl) crystals.

92. GRAPHS OF X-RAY ABSORPTION COEFFICIENTS FOR FOURTEEN SUBSTANCES. F. R. Gilmore, Rand Corp. April 10, 1959. (RM-2367-AEC) AECU-4353
NSA59-22606

93. THE GROWING OF SPECTROMETRIC CRYSTALS BY THE KYROPOULOS METHOD. L. M. Belyaev et al. Izvest. Akad. Nauk S.S.S.R., Ser. Fiz. 22, 21-2 (1958)
CA58-7864e

94. THE HALF-LIFE OF IODINE-131 AND THE ANOMALOUS DECAY OF EXPOSED SODIUM IODIDE SOURCES. W. K. Sinclair and E. W. Emery. Brit. J. Radiology 23, 576-8 (1950) Sept.
NSA50-6465

95. HOLLOW NaI(Tl) CRYSTAL FOR DETERMINING WEAK GAMMA ACTIVITY. J. Nagy and R. Voszka. Magyar Fiz. Folyoirat 6, 483-6 (1958) (Translated from Referat. Zhur. Fiz. No. 2, 1960, abstract No. 2770)
NSA60-21720

96. IRE TRANSACTIONS ON NUCLEAR SCIENCE. VOLUME NS-3, NO. 4. SCINTILLATION COUNTER SYMPOSIUM HELD FEB. 28-29 (1956) IN WASHINGTON, D. C. N. Y., The Institution of Radio Engineers, Inc. 1956.
NSA57-6482

Papers are included on recent developments on the background radiation detected by NaI crystals.

97. INELASTIC NUCLEAR REACTIONS OF PROTONS IN SCINTILLATORS. L. H. Johnston, D. H. Service and D. A. Swenson. IRE Trans. on Nuclear Sci. NS-5, No. 3, 95-8 (1958) Dec.

NSA59-3757

When a scintillation counter is used as a spectrometer for energetic protons, corrections must be made for the fact that (p,n) and other nuclear reactions may occur in the scintillator, causing some of the protons to register substandard pulse heights. These corrections were measured for thalliated sodium iodide.

98. INSTRUMENT RESEARCH AND DEVELOPMENT DIVISION QUARTERLY REPORT: DECEMBER, 1951. JANUARY AND FEBRUARY, 1952. Argonne National Lab. ANL-4778. p. 11.

NSA52-2974

Describes several improvements that have been made in the technique of packaging NaI(Tl) crystals for scintillation gamma-ray spectrometry.

99. INSTRUMENT RESEARCH AND DEVELOPMENT QUARTERLY PROGRESS REPORT FOR PERIOD ENDING APRIL 20, 1952. Oak Ridge National Lab. ORNL-1336

NSA52-6415

Graphs are presented of the energy resolution of gamma rays by a scintillation spectrometer consisting of a 5819 photomultiplier tube on which is mounted any of various-sized NaI crystals.

100. INSTRUMENTATION AND CONTROLS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 1, 1959. Nov. 2, 1959. Oak Ridge National Lab. ORNL-2787, p. 64-7

NSA60-1642(R)

Describes techniques for mounting a sodium iodide phosphor.

101. INTENSITY CORRECTIONS FOR IODINE X-RAYS ESCAPING FROM SODIUM IODIDE SCINTILLATION CRYSTALS. P. Axel. Rev. Sci. Instr. 25, 391 (1954) Apr.

NSA54-3817

102. INTRINSIC EFFICIENCIES OF RIGHT CYLINDRICAL NaI CRYSTALS. Anon. Applied x-ray spectrometry. (C. E. Crouthamel ed. Pergamon Press, 1960).

103. INTRINSIC SCINTILLATOR RESOLUTION. G. G. Kelley et al. Nucleonics 14, No. 4, 53 (1956) Apr.

Evidence for intrinsic scintillator resolution was obtained by comparison of the line width from an artificial light flash to NaI line widths for various photomultipliers. Resultant data are tabulated.

104. INVESTIGATION OF ACTIVATOR DISTRIBUTION IN NaI-Tl CRYSTALS. B. O. Belikovich et al. Ukrain. Fiz. Zhur. 4, 108-15 (1959) Jan - Feb. (In Ukranian)

CA59-17906

105. INVESTIGATION OF SCINTILLATION COUNTERS FOR THE DETECTION OF SOFT X-RAYS. Eighth Quarterly Progress Report for April 1, 1953 to June 30, 1953. J. T. Nelson and M. Takeo. NP-5255

NSA54-5654

106. IONIZATION ENERGY LOSS OF MESONS IN A SODIUM IODIDE SCINTILLATION CRYSTAL. T. Bowen. Phys. Rev. 96, 754-64 (1954) Nov. 1

NSA55-708

107. IONIZATION OF KI, NaI, AND CsCl MOLECULES BY ELECTRONS. N. I. Ionov. Doklady Akademii Nauk S.S.S.R. 59, p. 467-469, January 21, 1948 (In Russian)

NSA48-1912

108. KINETICS OF GAMMA SCINTILLATIONS IN THALLIUM ACTIVATED SODIUM IODIDE CRYSTALS. I. K. Plyavin. Optika i Spektroskopiya 2, 384-6 (1957)

CA57-11108d

109. LARGE-CRYSTAL COUNTING, NaI(Tl) SCINTILLATION SPECTROMETER. M. A. Van Dilla. Nucleonics 17-150 Nov. 1959.

Description of a scintillation spectrometer used for measuring radioactivity in man and employing a large NaI(Tl) crystal (4-9 in. diam. and a few inches thick).

110. LARGE NaI SCINTILLATION COUNTER STUDY OF THE NEUTRON CAPTURE GAMMA RAYS FROM HYDROGEN. B. Hamermesh and R. J. Culp. Phys. Rev. 92, 211 (1953) Oct. 1

NSA54-364

111. LATTICE DYNAMICS OF ALKALI HALIDE CRYSTALS. A. D. B. Woods et al. Phys. Rev. 119, 980-99 (1960) Aug. 1
NSA60-22073

112. LINEARITY OF MONOCHROMATIC GAMMA-RADIATION IN A SCINTILLATION SPECTROGRAPH. D. Maeder and V. Wintersteiger. Helv. Phys. Acta 25, 465-7 (1952) AEC-tr-1941
NSA53-265

113. LIQUID SCINTILLATION SODIUM IODIDE (Tl) CRYSTAL FOR LOW-INTENSITY GAMMA COUNTING. J. Nagy and R. Voszka. Magy ar Fiz. Folyoirat 6, 483-6 (1958)
CA59-6803g

114. LOGARITHMIC AND LINEAR SCINTILLATION EXPOSURE-RATE METERS WITH SODIUM IODIDE CRYSTALS. W. G. Spear. U. S. AEC. HW-47194
CA57-13596i

The instruments described utilize a 1-mm NaI(Tl) crystal and have a max. sensitivity of 0.05 mr/hr. full scale with a drift rate less than 3% of full scale.

115. THE LONG-LIVED PHOSPHORESCENT COMPONENTS OF THALLIUM-ACTIVATED SODIUM IODIDE. C. R. Emigh and and L. R. Megill. Aug. 25, 1953. Los Alamos Scientific Lab. AECU-2734
NSA54-298

With a $Co^{60}$ source as a means of primary irradiation, the long-lived phosphorescent decay of Tl-activated NaI crystal has been studied at a crystal temp. of 29.9 ± 0.1°C.

116. LOW ENERGY GAMMA SCINTILLATION SPECTROMETRY. C. J. Borkowski. IRE Trans. Nuclear Sci. Vol. NS-3, No. 4, 71-6 (Nov. 1956)
SA59-2763

117. LUMINESCENCE CENTRES IN ALKALI-HALIDE PHOSPHORS WITH LARGE CONCENTRATIONS OF THE ACTIVATOR AND OF MICRODEFECTS OF THE HALIDE LATTICE. T. Abdusadykov. Optika i Spektrosk. 7, No. 2, 250-3 (Aug. 59) ( In Russian)
SA60-4433

118. LUMINESCENCE CHARACTERISTICS OF SOME SCINTILLATING CRYSTALS. J. R. Cook and K. A. Mahmoud (Middlesex Hospital Medical School, London) Proc. Phys. Soc. (London) 67B, 817-24 (1954)
CA55-1439d

119. LUMINESCENCE OF ALKALI-HALIDE COMPOUNDS WITH URANYL SALT IMPURITIES. J. P. Shapiro. Optika i Spektrosk. 7, No. 1 (1959) July (In Russian)

SA60-4432

120. LUMINESCENCE OF ALKALINE IODIDES. J. Bonanomi and J. Rossel. Physica 18, 486-8 (1952) June-July (In French)

NSA52-6125

121. LUMINESCENCE OF CsI AND NaI. H. Enz and J. Rossel. Helv. Phys. Acta 31, No. 1, 25-32 (1958) (In French)

SA59-6761

122. LUMINESCENCE TWO-CRYSTAL GAMMA SPECTROMETER. E. L. Stolyarova and I. E. Konstantinov. Pribory i Tekh. Eksperimenta 1957, No. 1, 28-31.

CA57-17487d

A luminescence gamma spectrometer is described which is based on a coincidence method and registers the emission of Compton electrons. The spectrometer is constructed with a new photomultiplier tube FEU-C and NaI(Tl) crystals.

123. LUMINESCENT MATERIALS. E. K. Cole Ltd. and J. N. I. Evans. Brit. 796, 654, June 18, 1958.

CA59-882g

The addition of I to a concd. aq. NaI soln. contg. TlI followed by evapn. allows intimate assn. between the components in the crystal product.

124. LUMINESCENT SCINTILLATIONS IN ALKALINE IODIDES. J. Bonanomi and J. Rossel. Helv. Phys. Acta 25, 725-52 (1952)

CA53-5257b

Both gamma rays and alpha particles were used with the iodides of Li, Na, K, Rb, and Cs as pure salts and also Tl activated. The temperature range was 77-290° abs.

125. MTA PROJECT TARGET AND PROCESS SECTION QUARTERLY PROGRESS REPORT FOR JULY THROUGH SEPT. 1953. Calif. Research and Development Co. Livermore Research Lab., Livermore, California. p. 21. LRL-118

NSA57-10996

Gamma ray intensity measurements were greatly facilitated as a result of a detailed study of the photoelectric efficiency of NaI crystals in the energy range 0-1.3 Mev.

126. MEASUREMENT OF BREMSSTRAHLUNG SPECTRA WITH SODIUM IODIDE SCINTILLATION CRYSTAL. M. Kimure et al. J. Phys. Soc. Japan 14, 387-96 (1959)

CA59-17700d

127. MEASUREMENT OF GAMMA RAY AND NEUTRON SPECTRA WITH CsI(Tl), NaI(Tl), AND STILBENE CRYSTALS. N. G. Afanas'ev and V. Iu. Gonchar. Atomnaya Energiya 4, 289-92 (1958) March (In Russian)

NSA58-10814

128. MEASUREMENT OF GAMMA RAY ENERGIES WITH ONE CRYSTAL. J. A. McIntyre and R. Hofstadter. Phys. Rev. 78, 617-19 (1950)

CA50-8258e

129. MEASUREMENT OF GAMMA RAY ENERGIES WITH SINGLE CRYSTALS OF NaI(Tl). R. Hofstadter and J. A. McIntyre. Phys. Rev. 80, 631-7 (1950)

CA51-954e

130. MEASUREMENT OF GAMMA RAY ENERGIES WITH TWO CRYSTALS IN COINCIDENCE. R. Hofstadter and J. A. McIntyre. Phys. Rev. 78, 619-20 (1950)

CA50-8258f

131. MEASUREMENT OF NEUTRON DENSITIES WITH CRYSTALS OF NaI(Tl). B. Grimeland. Phys. Rev. 86, 937-9 (1952) June 15.

NSA52-4880

132. MEASUREMENT OF NEUTRON SPECTRA AND GAMMA RAY SPECTRA USING CsI(Tl) AND NaI(Tl) CRYSTALS IN STILBENE. N. G. Afanas'ev and V. Y. Gonchar. Soviet J. At. Energy 4, 383-7 (1958) (English Translation) At. Energy 4, 289-92 (1958)

CA59-12041i

A scintillation spectrometer is used to measure the radiation spectra of gamma rays from $Cs^{137}$ and $Co^{60}$ with a NaI(Tl) crystal in stilbene and the inelastic scattering of 3.1 Mev. neutrons of Fe with a NaI(Tl) crystal.

133. MEASUREMENT OF PHOTONEUTRON YIELDS WITH A SODIUM IODIDE CRYSTAL. K. G. McNeill. Phil Mag. 46, 321-6 (1955)

CA56-9170H

134. MEASUREMENT OF PROTON ENERGIES WITH SCINTILLATION COUNTERS. W. Franzen, et al. Phys. Rev. 79, 742-3 (1950)

CA50-9810b

135. MEASUREMENT OF THE ABSOLUTE QUANTUM YIELD OF PHOTOLUMINESCENCE OF ALKALI HALIDE CRYSTALS. Z. L. Morgenshtern. Soviet Phys. JETP 2, 773-4 (1956) (English translation); Zhur. Eksptl i Teoret Fiz 29, 903-4 (1955)
CA57-6354g

136. MEASUREMENT OF THE DECAY OF PHOSPHORESCENCE IN SEVERAL ALKALI HALIDES. H. Neuert and T. Retz-Schmidt. Z. Physik 134, 165-72 (1953) (In German)
NSA53-4192

137. MEASUREMENT OF THE ENERGY OF ALPHA, BETA, AND GAMMA RAYS BY MEANS OF A SCINTILLATION COUNTER. S. A. E. Johansson. Arkiv. Fysik 2, 171-86 (1950) (In English)
CA50-9265c

138. MEASUREMENTS AND STANDARDS OF RADIOACTIVITY. PROCEEDINGS OF AN INFORMAL CONFERENCE. Easton, Maryland, October 9-11, 1957. Nuclear Science Series Report No. 24. Washington, NAS-NRC, 1958.
NSA59-8265

Information is included on measurements and standards for alpha, beta, and gamma radiation; electron capture, nuclides, and emitters of low-energy radiation, low-level counting and standardization programs of various countries.

139. MECHANISM OF THE SCINTILLATION PHENOMENON IN ALKALI HALIDE PHOSPHORS. W. J. Van Sciver. Electron. nucleaire, Compt. rend. Colloq. intern. Paris 1, 37-53 (1958) (In English)
CA60-10560e

140. METHOD FOR DETECTING NONPROPORTIONALITY OF RESPONSE FOR GAMMA-RAY SCINTILLATORS. R. W. Peelle and T. A. Love. Rev. Sci. Instr. 31, 205-6 (1960) Feb.
NSA60-10655

141. A METHOD FOR EMBEDDING SODIUM IODIDE CRYSTALS IN PLEXIGLASS FOR SCINTILLATION COUNTING. W. B. Ittner, III, and M. Ter-Pogossian. (nd) AECU-1506
NSA51-5307

142. METHODS OF GROWING SCINTILLATION CRYSTALS FOR SCINTILLATION COUNTERS. L. M. Belyaev et al. pp. 197-206 in "Growth of Crystals, Reports at the First Conference on Crystal Growth, 5-10 March 1956." N. Y. Consultants Bureau, Inc. 1958.
NSA59-5552

143. METHODS OF MEASUREMENT OF NEUTRON FLUX AT LOW LEVELS. F. P. Cowan and J. F. O'Brien. Proc. Intern. Conf. Peaceful Uses of Atomic Energy, Geneva, 1955, 14, 213-17 (Pub. 1956)

CA57-16127d

The following threshold detectors are discussed: anthracene, NaI(Tl), S, P, U, Bi, fast neutron survey meters, and thermal neutron meters.

144. MICROWAVE SPECTRA OF THE ALKALI HALIDES. A. Honig et al. Phys. Rev. 96, 629-42 (1954)

CA55-2871h

Data from the microwave spectra of NaI etc. are given and analyzed in terms of mol. and nuclear consts.

145. MOISTURE PROOFING OF LUMINESCENT THALLIUM-ACTIVATED SODIUM IODIDE. M. J. Toogood (to E. K. Cole, Ltd.) British Patent 796,187 Nuclear Eng. 4, 48 (1959) Jan.

NSA59-8461

146. MOLECULAR ASSOCIATION IN ALKALI HALIDE VAPORS (thesis) S. Datz. Oak Ridge National Lab. May 31, 1960. ORNL-2933

NSA60-15628

147. MOUNTING OF A NaI-Tl CRYSTAL IN AN AIR-TIGHT CASE. B. Mougin. Letter in J. Phys. Radium 16, No. 4, 339 (April 1955) (In French)

SA55-6935

148. MULTIPLE CRYSTAL GAMMA-RAY SPECTROSCOPY USING NaI-TlI CRYSTALS. J. K. Bair et al. 2/13/51 NEPA Div. NEPA-647

149. NRL QUARTERLY ON NUCLEAR SCIENCE AND TECHNOLOGY. PROGRESS REPORT FOR THE PERIOD JULY-SEPT. 1955. Oct. 1, 1955. Naval Research Lab., Washington, D. C. NP-5824

NSA56-1507

Efficiencies were calculated for NaI crystals, and the variation of efficiency with gamma energy is shown for crystals of various sizes.

150. NRL QUARTERLY ON NUCLEAR SCIENCE AND TECHNOLOGY PROGRESS REPORT FOR THE PERIOD JULY-SEPT. 1957. Naval Research Lab., Washington, D.C. p. 20-23. NP-6650.

NSA58-7999

A study of photons in NaI(Tl) scintillation counters. Using Monte Carlo calculations, a study has been made of the energy lost in NaI(Tl) scintillation crystals by photons up to 1.5 Mev in energy.

151. NRL QUARTERLY ON NUCLEAR SCIENCE AND TECHNOLOGY. PROGRESS REPT. FOR THE PERIOD OCT.-DEC. 1955. Naval Research Lab., Wash., D. C. NP-5876.

NSA56-5898

Using Monte Carlo calculations, a study was made of the energy lost in NaI(Tl) scintillation crystals by photons from 0.1 to 1.5 Mev.

152. NATURE OF EXCITATION SPECTRA OF SOME CRYSTALLOPHOSPHORS. F. D. Klement and A. F. Malysheva. Trudy Inst. Fiz. i Astron., Akad. Nauk. Eston S.S.R. 1955, No. 1, 44-56 (In Russian)

CA57-864g

The excitation of luminescence of Pb-activated phosphors with a Cd halide base resulted from the absorption of the excitation light by the ions of the activator. Similar conclusion was drawn from the observation of luminescence of NaI(Tl) and KI(Tl) phosphors.

153. NEUTRON PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING SEPT. 1, 1959. Oak Ridge National Lab. ORNL-2842

NSA60-2804

p. 181-184 Nonproportionality of response of an NaI(Tl) scintillation crystal to gamma rays.
p. 191-192 Comparison of experimental gamma-ray responses of an 8 in. diam. NaI(Tl) crystal with calculated responses.

154. NEW STUDIES ON THE PHYSICAL PROPERTIES OF ORGANIC AND MINERAL SCINTILLATORS. L. Koch et al. p. 53-6 of "Nuclear Electronics. I" (In French)

NSA60-5406

The effects of the mode of excitation on the decay time was investigated for silver-activated zinc sulfide, NaI(Tl) and CsI(Tl) and the natural phosphor $CaF_2$.

155. NONLINEAR RESPONSE OF NaI(Tl) TO PHOTONS. D. Engelkemeir. Rev. Sci. Instr 27, 589-91 (1956) Aug.

NSA56-11361

156. NOTE ON THE ESCAPE PEAK CORRECTION FOR NaI(Tl) CRYSTALS. W. E. Meyerhof and H. I. West, Jr. Rev. Sci. Instr 25, 1025 (1954) Oct.

157. NUCLEAR CHEMICAL RESEARCH RADIOCHEMICAL SEPARATIONS AND ACTIVATION ANALYSIS. PROGRESS REPORT NO. 7 FOR NOV. 1957 - OCT. 1958. Michigan Univ. Dept. of Chemistry. AECU-3887

NSA59-2029

A description is given of a three inch scintillation crystal detector and housing. The resolution of the 3 in. x 3 in. NaI(Tl) crystal was determined as a function of gamma energy.

158. NUCLEAR MAGNETIC RESONANCE STUDIES OF DISLOCATIONS IN NaI and KI. J. F. Hon and P. J. Bray. J. Appl. Phys. 30, 1425-8 (1959) Sept.

NSA59-22721

Intensity anomalies were found in the nuclear magnetic resonance of $I^{127}$ in NaI and KI single crystals when the magnetic field is along a (1,0,0) type direction. These studies afford an explanation of anomalous resonance line widths reported for NaI by other observers.

159. OBSERVATION OF NONPROPORTIONALITY OF RESPONSE FOR A NaI(Tl) SCINTILLATION CRYSTAL. R. W. Peelle and T. A. Love. Dec. 7, 1959. Oak Ridge National Lab. ORNL-2801

NSA60-3861

160. ON DISTORTIONS OF COMPLETE ENERGY LINES BY NaI(Tl) CRYSTALS. Y. A. Nemilov et al. Pribory i Tekh. Ekspt. No. 4, 72-3 (1959) July- Aug. (In Russian)

NSA59-21113

Studies were made of the observed "doubling" caused by some NaI(Tl) crystals in complete energy lines. The expanded "doubling" is shown graphically. It was found that moisture and reorientation can cause the doubling effect.

161. ON PROBLEMS OF LINEARITY IN SCINTILLATION SPECTROMETRY. I. SCINTILLATION REACTION OF INORGANIC CRYSTALS TO GAMMA EXCITATION. Y. A. Nemilov et al. Izvest Akad. Nauk S.S.S.R. Ser. Fiz. 23, 257-62 (1959) Feb. (In Russian)

NSA59-12614

162. ON THE ENERGY RESOLUTION OF SCINTILLATION COUNTERS. L. S. Kukushkin and A. M. Ratner. Translated by Lydia Venters (ANL) from Zhur. Tekh. Fiz. 28, 345-50 (1958) 11 p. AEC-tr-3339

NSA58-16567

163. ON THE ENERGY RESOLUTION OF SCINTILLATION COUNTERS. II. A. M. Ratner and L. S. Kukushkin. Zhur. Tekh. Fiz. 28, 1121-5 (1958) May (In Russian)

NSA58-15748

164. ON THE ENERGY RESPONSE AND RESOLUTION OF A SCINTILLATION COUNTER. S. Dhar, Indian J. Phys. 29, No. 7, 329-51. July, 1955.

SA56-2961

165. ON THE GROWING OF SPECTROMETRIC CRYSTALS ACCORDING TO THE METHOD DEVELOPED BY KYROPOULOS. L. M. Belyaev et al. Izv. Akad. Nauk S.S.S.R., Ser Fiz., 22, No. 1, 21-2 (1958) (In Russian) English summary. PB 14041T-1

SA59-9000

166. ON THE RELATION OF THE PHYSICAL PROPERTIES OF CRYSTALS TO MOLECULAR CONCENTRATION. P. A. Savintsev, Soviet Phys. (Doklady) 1, 591-3 (1956) Sept.-Oct.

NSA58-7412

167. ON THE SURFACE EFFECT OF SODIUM IODIDE SCINTILLATORS. E. der Mateosian and C. L. Yuan. 1952. Brookhaven National Lab. BNL-1362

NSA53-3511

168. ON THE V-CENTERS IN ALKALI IODIDE CRYSTALS. Y. Uchida and Y. Nakai. J. Phys. Soc. Japan 9, No. 6, 928-34 (Nov.-Dec. 1954)

SA55-3271

The properties of V-centers were investigated in the alkali iodide crystals (KI and NaI) containing excess iodine.

169. OPTICAL CEMENT FOR THE NaI(Tl) CRYSTALS. I. E. Pani. Zhur. Tekh. Fiz. 25, 2369-70 (1955) Nov. (In Russian)

NSA56-1891

170. OPTICAL STUDIES ON THALLIUM-ACTIVATED ALKALI-IODIDE CRYSTALS. Y. Uchida and R. Kato. J. Phys. Soc. Japan 14, 1408-14 (1959) Oct.

NSA60-1939

171. PACKAGING OF NaI(Tl) CRYSTALS FOR SCINTILLATION SPECTROMETRY. R. K. Swank and J. S. Moenich. Rev. Sci. Instr. 23, 502-3 (1952)

CA53-1500e

172. PAIR PRODUCTION AND PHOTOELECTRIC EFFECT IN SCINTILLATION PHOSPHORS. P. R. Bell. Science 112, 7-9 (1950).

CA50-8248g

173. PEAK EFFICIENCY OF NaI. N. H. Lazar et al. Nucleonics 14, No. 4, 52 (1956) Apr.

NSA56-7902

174. PEAK EFFICIENCY OF NaI(Tl) CRYSTALS FOR GAMMA RAYS FROM 0.150 TO 7.5 Mev. N. H. Lazar et al. IRE TRANS. NUCLEAR SCI NS-3, No. 4, 136-7 (1956) Nov.

NSA57-4586

175. PHOTOELECTRIC ABSORPTION OF GAMMA RAYS IN THALLIUM ACTIVATED SODIUM IODIDE. K. E. Johansson. Arkiv Fysik 10, 247-78 (1955) (In English)

CA56-9893g

176. PHOTOGRAPHY OF COSMIC RAY TRACKS WITH A CASCADE LUMINESCENT CHAMBER. Rept. No. 2900-11-T. L. W. Jones and M. L. Perl. May, 1959. AD-216789

NSA60-7974

A cascade luminescent chamber made up of three image tubes coupled with refractive optics was used to photograph tracks of cosmic ray $\mu$ mesons in a sodium iodide crystal.

177. PHOTOLUMINESCENCE OF THE SUBLIMATE PHOSPHOR NaI(Tl). K. V. Shalimova. Doklady Akad. Nauk S.S.S.R. 66, 851-4 (1949)

CA49-7348h

178. PHOTOPROTON SCINTILLATION SPECTROMETER. A. L. Whetstone et al. Rev. Sci. Instr. 29, 415-19 (1958)

CA59-12042b

179. PHYSICAL CONSTANTS OF THE ALKALI HALIDES OF THE NaCl TYPE. K. Spangenberg. Naturwissenschaften 43, 394 (1956)

CA59-17642e

180. PHYSICS DIVISION PROGRESS REPORT FOR JAN. 1 TO MAR. 31, 1959. AECL-830. Atomic Energy Division of Canada, Ltd. Chalk River. PR-P-41

NSA59-16314

A study was made of the frequency wavelength relationship for elastic waves traveling in single crystals of lead and sodium iodide.

181. PHYSICS DIVISION PROGRESS REPORT APRIL 1, 1959 TO JUNE 30, 1959. AECL-888. Atomic Energy Division of Canada, Ltd. Chalk River. PR-P-42. p. 42

NSA60-1913

Lattice vibrations in sodium iodide.

182. PHYSICS DIVISION QUARTERLY PROGRESS REPORT FOR PERIOD ENDING SEPT. 20, 1952. Oak Ridge National Lab. ORNL-1415. p. 10
NSA53-2009

Ratio of peak to total for a thallium-activated sodium iodide crystal.

183. PHYSICS DIVISION SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING SEPT. 10, 1953. Oak Ridge National Lab. ORNL-1620
NSA54-1910

A Tl activated NaI crystal has been made to give good resolution and its use as a self-coincident detector has already been shown to be very helpful in decay scheme determinations.

184. PHYSICS DIVISION SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING MARCH 10, 1954. Oak Ridge National Lab. ORNL-1705 p. 11
NSA54-4986

Gamma-ray spectrum and gamma-ray yield from boron bombarded by protons.

185. PHYSICS DIVISION SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING SEPT. 10, 1955. Oak Ridge National Lab. ORNL-1975
NSA56-3144

The peak efficiency of various NaI(Tl) crystals is given as a function of gamma energy.

186. PHYSICS DIVISION SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING MARCH 10, 1956. J. F. Fowler and E. O. Wollan, eds. Oak Ridge National Lab. ORNL-2076. p. 55
NSA56-6755

Extension of peak efficiency of 3 x 3 in. NaI(Tl) crystal to high energies.

187. PHYSICS DIVISION SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING SEPT. 10, 1956. Oak Ridge National Lab. ORNL-2204. p. 57
NSA57-4016

Variation of NaI(Tl) detection efficiencies with crystal size and geometry for medical research.

188. POLISHING AND SETTING OF SODIUM IODIDE (Tl) CRYSTALS. G. Mathe. Magyar Fiz. Folyoirat 6, 369-71 (1958)
CA59-863h

189. POLISHING TECHNIQUES FOR NaI(Tl). C. A. Stone et al. Rev. Sci. Instr 22, 1027 (1951) Dec.
NSA52-1810

190. PREPARATION AND PERFORMANCE OF SOME SCINTILLATION CRYSTALS. J. A. Harshaw et al. Sept. 10, 1952. Harshaw Chem. Co. NYO-1577

NSA52-6414

The work covers study of thallium-activated sodium iodide to determine the effect of production variables on operation and to develop production methods of finishing and mounting this material to obtain good performance.

191. PREPARATION OF SINGLE CRYSTAL OF THALLIATED SODIUM IODIDE. R. Kiyama and K. Shimizu. Rev. Phys. Chem. Japan 27, 68-70 (1957)

CA58-14272h

192. PREPARING THIN SODIUM IODIDE CRYSTALS WITH A MICROTOME. L. Cranberg (nd). Los Alamos Scientific Lab. AECU-2290; LADC-1278

NSA53-527

193. PRESSURE EFFECTS IN LUMINESCENCE: ISOBARIC EXPERIMENTS ON NaI(Tl). L. Reiffel. Phys. Rev. 114, 1493-9 (1959) June 15

NSA59-22747

194. PRESSURE EFFECTS IN PHOSPHORESCENCE. L. Reiffel. Phys. Rev. 94, 856 (1954) May 15

NSA54-4330

195. PROCEEDINGS OF THE LARGE CRYSTAL SPECTROMETRY SYMPOSIUM HELD IN CINCINNATI, OHIO, MAY 23, 1958. J. G. Carver, comp. General Electric Co. ANP Dept.

NSA59-10141

An informal symposium on the subject of gamma-ray spectroscopy through the use of large (9 x 9 in.) single crystals of sodium iodide (Tl activated).

196. PRODUCTION TECHNIQUE FOR LONG SECTIONS OF SODIUM IODIDE (thallium) SCINTILLATION CRYSTALS. D. J. Chleck. Rev. Sci. Instr. 28, 288-9 (1957).

197. PROGRESS REPORT FOR OCTOBER 1 TO DECEMBER 31, 1958. AECL-770. Atomic Energy of Canada, Ltd. Chalk River, PR-P-40.

NSA59-10154

A detailed study of the frequency-wavelength relation for elastic waves travelling in single crystals of silicon and sodium iodide was accomplished using the new neutron diffraction crystal spectrometer at the NRU reactor and the rotating crystal spectrometer at NRX.

198. PROGRESS REPORT (NO. 54) COVERING THE PERIOD FOR PHYSICS AND CHEMISTRY THROUGH APRIL 30, 1959. Mass. Inst. of Tech. Lab for Nuclear Science. AECU-4525. p. 96
NSA60-6071

A brief description of a new coated unactivated NaI scintillator and a new photomultiplier which have been put into operation.

199. PROTECTIVE CONTAINERS FOR NaI(Tl). L. Reiffel et al. Rev. Sci. Instr. 22, 1026-7 (1951) Dec.
NSA52-1811

200. THE PULSE HEIGHT DISTRIBUTION FROM A SODIUM IODIDE SINGLE CRYSTAL SCINTILLATION COUNTER AND THE MEASUREMENT OF GAMMA RAY FLUXES. C. M. Griffiths. Can. J. Physics 33, 209-18 (1955) May.
NSA55-4534

201. PULSE HEIGHT SPECTRUM PRODUCED IN SODIUM IODIDE BY NUCLEAR GAMMA RAYS OF VARIOUS ENERGIES. W. M. Good et al. Phys. Rev. 83, 239-40 (1951)
CA53-6775a

202. QUARTERLY PROGRESS REPORT FOR MTR TECHNICAL BRANCHES, SECOND QUARTER, 1957. J. E. Evans, ed. Phillips Petroleum Co. Atomic Energy Div., Idaho Falls. IDO-16394
NSA57-13430

In the decay scheme program, studies on the efficiencies of 3 x 3 in. NaI crystals have been continued.

203. QUARTERLY PROGRESS REPORT FOR MTR-ETR TECHNICAL BRANCHES. THIRD QUARTER, 1957. K. A. McCollom, ed. Phillips Petroleum Co. Atomic Energy Div., Idaho Falls. IDO-16430
NSA58-8064

In the decay schemes program, the machine calculated detection efficiencies of sodium iodide scintillation crystals are being checked experimentally.

204. QUARTERLY PROGRESS REPORT FOR MTR-ETR TECHNICAL BRANCHES, FIRST QUARTER, 1958. R. G. Fluharty, ed. Phillips Petroleum Co. Atomic Energy Div., Idaho Falls. IDO-16474
NSA59-2551

Calculations of the gamma-ray detection efficiencies of different shapes of NaI crystals and extended sources were completed.

205. QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JUNE 15, 1950. Physics Div. Oak Ridge National Lab. ORNL-782

NSA51-618

Thallium-activated NaI gives very satisfactory performance as a phosphor, and gamma spectra have been obtained with it from a 330 day Cd, $Hg^{203}$, $Cs^{137}$, $Co^{60}$, $K^{42}$, $Na^{24}$, $Cu^{64}$, and a Po-Be-$B_4C$ neutron source ($C^{12}$ excited state at 4.4 Mev)

206. QUARTERLY PROGRESS REPORT NO. 51 FOR PERIOD ENDING OCTOBER 15, 1958. J. B. Wiesner et al. Mass. Inst. of Tech. Research Lab for Electronics. NP-7107

NSA59-5661

The three adiabatic constants of NaI were measured at 170 to 300°K by an ultrasonic pulse-echo technique.

207. QUENCHING OF NaI FLUORESCENCE BY $H_2$, HCl, $CO_2$, AND $H_2O$. H. G. Hanson. J. Chem. Phys. 23, No. 8, 1391-7 (Aug. 1955)

SA55-8634

208. RADIATION DAMAGE STUDIES IN SOLIDS: NUCLEAR RESONANCE ABSORPTION TECHNIQUE. Period covered Jan. 1, 1958 through Oct. 31, 1958. P. J. Bray. Brown Univ. NYO-7625

NSA59-8208

Experimental and theoretical studies of the preferential orientation of dislocations in single crystals of NaI and KI have progressed. Nuclear Magnetic Resonance studies of proton-irradiated (160 Mev) crystals of NaI and other alkali halides were started.

209. RADIATIONS OF CERTAIN SYNCHROTRON-INDUCED RADIOACTIVITIES. S. H. Cox, Jr. and L. J. Laslett. June, 1952. Ames Lab. ISC-276

NSA53-1000

The usefulness of scintillation-counter techniques in studies of synchrotron induced activities has been confirmed by this investigation. A method developed for preserving and mounting NaI, made the use of these crystals practical for gamma ray coincidence and energy measurements.

210. REDUCTION OF NaI BACKGROUND. C. E. Miller, L. D. Marinelli, R. E. Rowland, and J. E. Rose. Nucleonics 14, No. 4, 40-3 (1956) Apr.

NSA56-7894

Reduction of background counting rates of scintillation crystals.

211. REPRESENTATION OF OPTICAL CHARACTERISTICS OF ABSORBING MEDIA IN INFRARED REGION BY MEANS OF A RESONATOR MODEL WITH VISCOUS FRICTION. II. Alkali-halide crystals. L. D. Kislovskii. Optika i Spektroskopiya 2, 186-94 (1957)
CA57-16074g

212. RESEARCH ON CRYSTAL DETECTORS OF IONIZING RADIATION: STUDIES AND APPLICATION OF SCINTILLATION COUNTERS. Third quarterly progress rept. R. Hofstadter, Princeton Univ. (nd) For Period ending: May 1, 1950. NP-1556
NSA50-4986

It was found that heretofore unknown resolution of gamma rays by NaI(Tl) can be achieved by using a single crystal. Studies have been made of the rate of decay of NaI(Tl) pulses as a function of temperature. Methods were developed showing that NaI(Tl) can be well preserved against moisture damage by enclosure in lucite.

213. RESOLUTION OF PHOTOMULTIPLIERS IN SCINTILLATION SPECTROMETERS. J. Kopecky and J. Kajfosz. Czechoslov. J. Phys. 8, 171-80 (1958) (In English)

214. RESPONSE CURVES OF ALKALI HALIDE SCINTILLATORS WITH SPECIAL REFERENCE TO THE $Li^6$ $(n,\alpha)$ REACTION IN LITHIUM IODIDE. T. R. Ophel (1958) Australian National Univ. Research School of Physical Sciences, Canberra. ANU/P-184.
NSA58-12568

215. RESPONSE FUNCTION OF NaI(Tl) SCINTILLATION COUNTERS. M. J. Berger and J. Doggett. J. Research Natl. Bur. Standards 56, 355-66 (1956) Research Paper No. 2686.
CA57-879h

216. RESPONSE FUNCTION OF NaI(Tl) SCINTILLATION COUNTERS. M. J. Berger and J. Doggett. Rev. Sci. Instr. 27, 269-70 (1956)
CA57-17489c

217. RESPONSE FUNCTION OF THALLIUM-ACTIVATED SODIUM-IODIDE SCINTILLATION COUNTERS. See No. 215 above.

218. RESPONSE OF A LARGE SODIUM-IODIDE DETECTOR TO HIGH-ENERGY X-RAYS. J. H. Hubbell. Rev. Sci. Instr. 29, 65-8 (1958)

219. RESPONSE OF A SODIUM IODIDE SCINTILLATION COUNTER TO 18 Mev GAMMA RADIATION. J. G. Campbell and A. J. F. Boyle. Australian J. Phys. 7, 284-7 (1954)
CA54-11205f

220. THE RESPONSE OF A NaI SCINTILLATION COUNTER TO SLOW AND FAST NEUTRONS. M. A. Grace et al. Proc. Phys. Soc. (London) A65, 456-7 (1952) June 1

NSA52-4590

221. RESPONSE OF A SODIUM IODIDE SCINTILLATION SPECTROMETER TO 10- TO 20- Mev ELECTRONS AND X-RAYS. H. W. Koch and J. M. Wyckoff. J. Research Natl. Bur. Standards 56, 319-26 (1956) Research Paper No. 2682.

CA57-845g

222. RESPONSE OF A NaI(Tl) CRYSTAL TO MONOERGIC NEUTRONS. S. M. Shafroth et al. Nuclear Instr. 3, 298-302 (1958)

CA59-14746g

223. RESPONSE OF ACTIVATED INORGANIC SCINTILLATORS TO THE ENERGY RESPONSE OF INCIDENT RADIATIONS. A. Meessen. Ann. Soc. Sci. Bruxelles, Ser I, 69, 102-16 (1955)

CA1956-7597e

224. RESPONSE OF CRYSTAL PHOSPHORS TO NUCLEAR RADIATION. Technical Note No. 1. L. Reiffel. June 4, 1957. AD-132384. Illinois Inst. of Tech. Armour Research Foundation. OSR-TN-57-313

NSA57-12070

225. RESPONSE OF SODIUM IODIDE CRYSTALS TO ALPHA PARTICLES AND ELECTRONS AS A FUNCTION OF TEMPERATURE. E. der Mateosian et al. Phys. Rev. 101, 967-71 (1956) Feb. 1

NSA56-5840

226. RESPONSE OF SODIUM IODIDE CRYSTALS TO HIGH ENERGY PROTONS. J. G. Likely and W. Franzen. Phys. Rev. 87, 666-7 (1952)

CA52-10939h

227. RESPONSE OF NaI(Tl), KI(Tl), AND STILBENE TO FISSION FRAGMENTS. J. Milton and J. Fraser. Phys. Rev. 96, 1508-11 (1954) Dec. 15

NSA55-1606

228. RESPONSE OF NaI(Tl) TO ENERGETIC HEAVY IONS. E. Newman and F. E. Steigert. Phys. Rev. 118, 1575-8 (1960) June 15

NSA60-18290

229. RESPONSE OF NaI(Tl) TO SODIUM NUCLEI. E. N. Shipley et al. Rev. Sci. Instr. 30, 604-5 (1959)

230. RESPONSE OF SOME SCINTILLATION CRYSTALS TO CHARGED PARTICLES. C. J. Taylor et al. Phys. Rev. 84, 1034-43 (1951) Dec. 1

NSA52-966

231. RESPONSE OF SOME SCINTILLATION CRYSTALS TO HEAVY PARTICLES. C. J. Taylor et al. Phys. Rev. 83, 169-70 (1951)

CA51-8902h

232. RESPONSE OF "TOTAL ABSORPTION" SPECTROMETERS TO GAMMA RAYS. R. C. Davis et al. IRE Trans. on Nuclear Sci. NS-3, No. 4, 82-6 (1956)

CA57-4832e

233. RESPONSE SPECTRA FOR GAMMA RAYS IN CsI. W. F. Miller and W. J. Snow. Rev. Sci. Instr. 31, 861-2 (1960) Aug.

NSA60-23084

Comparisons between the response spectra for CsI(Tl) and NaI(Tl) crystals of the same size are presented.

234. THE RESPONSE TO HIGH ENERGY GAMMA RAYS OF A NaI(Tl) SCINTILLATION SPECTROMETER. J. Kockum and N. Starfelt. Nuclear Instr. and Methods 4, 171-80 (1959) Apr.

NSA59-14481

235. SCINTILLATING SOLUTIONS CONTAINING HEAVY ELEMENTS. H. P. Kallman et al. IRE Trans. on Nuclear Sci. NS-3, No. 4 51-6 (1956)

CA57-4825d

Experiments have been performed with inorg. salts, such as $Cu(NO_3)_2$, $AgNO_3$, and NaI dissolved in a dioxane-water soln. Tables of the fluorescence of solns. contg. various metal salts are given.

236. SCINTILLATION AND OTHER RELATED PROPERTIES OF UNACTIVATED NaI CRYSTALS. Progress rept. for the period Jan 1, 1957 - Mar. 31, 1957. W. J. Van Sciver. Levinthal Electronic Products, Inc. AECU-3536.

NSA57-11323

237. SCINTILLATION CONVERSION EFFICIENCY OF NaI(Tl) CRYSTALS. I. I. Lomonosov et al. Pribory i Tekh. Ekspt., No. 4, 70-1 (1959) July-Aug. (In Russian)

NSA59-21112

238. SCINTILLATION COUNTER. S. Shimizu et al. Bull. Inst. Chem. Research, Kyoto Univ. 25, 54 (1951)

CA54-6851f

For measuring gamma ray energy and intensity, a scintillation counter was used with employment of transparent NaI and anthracene crystals prepd. by slow cooling method.

239. THE SCINTILLATION COUNTER AS A LOW-RESOLUTION GAMMA RAY SPECTROMETER. R. W. Pringle et al. Rev. Sci. Instruments 21, 216-18 (1950)

CA50-6733c

240. SCINTILLATION COUNTER FOR X-RAYS. G. Brogren and C. G. Rylander. Arkiv. Fysik 4, 495-9 (1952) (In English)

CA52-8981b

Scintillation counters with crystals of naphthalene, Ag activated ZnS, $CdWO_4$ and Tl-activated NaI were tested for their sensitivity to hard x-rays. The best results were obtained with Tl-activated NaI where an efficiency of 100% was recorded for all wave lengths even at normal background.

241. SCINTILLATION COUNTERS. W. W. Managan. Argonne National Lab. AECL-805. (Paper 5.10)

NSA60-5319

Thallium-activated sodium iodide, NaI(Tl), for gamma-ray and charged-particle spectrometry is described. Items described include a sandwich-type double crystal and ($\Delta$E.E) product coincidence circuit for particle-mass and -charge discrimination in deuteron-scattering experiments, a gamma spectrometer using a 4 in. x 4 in. cylindrical NaI(Tl) crystal, the facilities for machining and packaging hygroscopic scintillators, and the current development status of sodium iodide scintillators.

242. SCINTILLATION COUNTERS FOR RADIOACTIVE SAMPLE MEASUREMENT. H. O. Anger. Rev. Sci. Instr. 22, 912-14 (1951)

CA52-4918i

Description of a counter using an NaI(Tl) crystal.

243. SCINTILLATION COUNTING: J. K. Bair. Mar. 16, 1951. NEPA Div. NEPA-1645.

NSA52-646

Techniques are given for the preparation of sodium iodide crystals.

244. SCINTILLATION COUNTING OF NATURAL URANIUM FOILS. R. C. Axtmann and J. S. Stutheit. Nucleonics 12, No. 7, 52-3 (1954)
CA54-11205c

Describes use of natural U foils for measurement of reactor neutron flux. Fission-product activation and $U^{238}$ capture activation of U foils can be sepd. with a NaI(Tl) scintillation crystal spectrometer.

245. SCINTILLATION GAMMA SPECTROMETER. L. Pelekis. Trudy Inst. Fiz. Akad Nauk Latv. S.S.R., Fiz. i Tekh. Primenen. Radioaktiv. Izotopov 9, 3-9 (1956)
CA57-17489d

Details are given for assembling a spectrometer for use with luminescent crystals of CsI(Tl) and NaI(Tl) followed by a photoelectronic multiplier, a preamplifier, and a radio-technical scheme for computing and analyzing the amplitude of the pulses.

246. SCINTILLATION MATERIALS AND METHODS OF MAKING SAME. (To Armour Research Foundation, U.S.A.) British Patent 792,071. Nuclear Eng. 3, 414 (1958) Sept.
NSA58-17954

It has been discovered that the scintillation characteristics of a single crystal scintillator can be closely approximated by an autogeneously banded polycrystalline compact made from a compacted mass of microcrystals of a host compound, permitting propagation of energy derived from nuclear radiation and an activator capable of fluorescence under the influence of such energy.

247. A SCINTILLATION PAIR SPECTROMETER. H. I. West, Jr. and L. G. Mann. Rev. Sci. Instr. 25, 129-135 (1954)
CA54-8665d

The spectrometer described involves the use of 3 NaI(Tl) crystals and has a high rejection of all unwanted pulses. The gamma rays pass into a center crystal and the pair events are selected by detecting the 2 annihilation quanta in the side crystals, along with coincidence circuits of 0.15 microsec. resolution.

248. SCINTILLATION PHENOMENA IN SODIUM IODIDE. W. J. Van Sciver and L. Bogart. IRE Trans. on Nuclear Sci. 5, 90-2 (1958)
CA59-11018g

249. SCINTILLATION PHENOMENA IN NaI AND CsF (thesis). W. J. Van Sciver. Stanford Univ., Calif. High-Energy Physics Lab. Apr., 1955. HEPL-38
NSA55-5109

250. THE SCINTILLATION RESPONSE FROM NaI(Tl) CRYSTALS UNDER BOMBARDMENT WITH POSITIVE IONS OF ENERGIES 60-600 kev. S. K. Allison and H. Casson. Phys. Rev. 90, 880-5 (1953) June 1

NSA53-4189

251. SCINTILLATION RESPONSE OF ACTIVATED IONIC CRYSTALS TO CHARGED PARTICLES. A. Meyer and R. B. Murray. IRE Trans. Nuclear Sci. NS-7, No. 2-3, 22-5 (1960) June-Sept.

NSA60-25688

252. SCINTILLATION RESPONSE OF PHOSPHORS AT LOW PARTICLE ENERGIES. G. T. Wright. Phys. Rev. 96, 569-70 (1954) Nov. 1

NSA55-707

253. A SCINTILLATION SPECTROMETER. B. Astrom. Arkiv. Fysik 7, 241-5 (1953)

CA54-10442f

The design and performance of a scintillation spectrometer with NaI(Tl) crystals is described. A method of improving the overload characteristics of a linear amplifier and the circuit of a simple one-channel differential discriminator is given.

254. SCINTILLATION SPECTROMETER WITH AN ANTI-COINCIDENCE ANNULUS OF NaI(Tl). C. C. Trail and S. Raboy. Rev. Sci. Instr. 30, 425-9 (1959)

255. SCINTILLATION SPECTROMETERS FOR GAMMA-RADIATION. I. K. Jordan. Arch. tech. Messen No. 260, 193-6 (1957)

CA58-2569e

(See Item No. 270)

256. SCINTILLATION STUDIES OF ALKALI HALIDES. J. Bonanomi and J. Rossel. Helv. Phys. Acta, 24, 310-15 (1951)

CA52-2414h

The compounds studied were LiI, NaI, and KI, both as pure salts and activated with Tl. The measurements included the no. of scintillations per sec. as a function of temp. (100-200°K) after excitation with the 1.2 Mev gamma rays from $Co^{60}$, the rise-time and amplitude of the charge produced in an electron multiplier, the decay of the luminescence, and the glow-curves observed.

257. SCINTILLATION THEORY. Nucleonics 18, No. 5, 86-7. May, 1960.
SA60-13702

A review of several papers presented at the 1960 Scintillation Counter Symposium in Washington. The response of alkali halide crystals has been calculated using a model including the combination of hole-electron pairs into excitons, which diffuse and excite activators which then decay radiatively.

258. SCINTILLATION TYPE ION DETECTOR. P. I. Richards and E. E. Hays. Sept. 1949. AECU-678
NSA50-1748

A sensitive detector is described for use with a time of flight mass spectrometer to indicate the time of arrival of low energy ions. Three phosphors were studied; Ag activated ZnS, thallium activated NaI, and anthracene.

259. SCINTILLATIONS AND LUMINESCENCE IN UNACTIVATED SODIUM IODIDE. W. Van Sciver and R. Hofstadter. Phys. Rev. 97, 1181 (1955)
CA55-7402e

260. SCINTILLATOR GRID LOCALIZES GAMMA EMITTERS PHOTOGRAPHICALLY. C. Kellershohn and P. Pellerin. Nucleonics 13, No. 12, 34-7 (1955) Dec.
NSA56-1476

A system of NaI crystals set in a lead collimating grid has been designed which permits the "in vivo" localization of a radioactive body.

261. SEMICONDUCTOR ABSTRACTS. Battelle Memorial Institute. Vol. 1-, 1953- New York, Wiley.
Contains a section listing abstracts of articles pertaining to the luminescence of sodium halides.

262. SIMPLE EFFICIENT SHIELD FOR WELL-TYPE SCINTILLATION CRYSTALS. J. W. Irvine, Jr. Nucleonics 12, No. 10, 62-3 (1954)

263. A SIMPLE METHOD FOR THE ESTIMATION OF THE EFFICIENCY OF A NaI WELL-TYPE SCINTILLATOR. W. D. Schmidt-Ott. Z. Phys. 154, No. 3, 294-300 (1959) (In German)
SA59-9490

264. SLOW COMPONENT IN DECAY OF FLUORS. F. B. Harrison. Nucleonics 12, No. 3, 24-5 (1954)
CA54-6839c

NaI has one component with a decay time of 200 microsec. and something with a mean life of 1-13 sec., with 1.5% remaining after 1 sec.

265. A SLOW COMPONENT IN THE DECAY OF THE SCINTILLATION PHOSPHORS. J. A. Jackson and F. B. Harrison. Phys. Rev. 89, 322 (1953)

CA53-5256e

266. SODIUM IODIDE COUNTING RESPONSE FOR GAMMA RAYS. W. E. Kregar and L. McIsaac. Phys. Rev. 93, 943 (1954)

CA55-10042c

267. NaI SUMMING SPECTROMETER. P. Shapiro and R. W. Higgs. Rev. Sci. Instr. 28, 939-4 (1957)

A discussion on the analysis of pulse-height distributions obtained with gamma-ray sources placed inside well-type (Tl) NaI crystals.

268. SOME LINEARITY QUESTIONS IN SCINTILLATION SPECTROMETRY. Y. A. Nemilov et al. Izvest. Akad. Nauk. S.S.S.R. Ser. Fiz. 23, 257-62 (1959)

CA59-11018a

The dependence of line distortion and resolution in NaI(Tl) crystals is also briefly discussed.

269. SPECTRAL RELATION IN THE YIELD OF PHOTOLUMINESCENCE OF THALLIUM-ACTIVATED ALKALI IODIDES. Z. L. Morgenshtern. Doklady Akad. Nauk. S.S.S.R. 105, 250-2 (1955).

CA56-11826e

Relative yields of photoluminescence obtained with Tl-activated KI, NaI, and CsI monocrystals were measured as a function of wave length.

270. SPECTROMETRE A SCINTILLATIONS POUR RAYONNMENT GAMMA. (Scintillation spectrometer for gamma radiation, Part 1). K. Jordan. Translated into French from Arch. Tech. Messen, 260, 193-6 (1957) See Item No. 255

NSA59-16945

The absorption of gamma radiation in NaI crystals is described. Photoelectric effect, Compton effect, and pair formation and the frequency of these processes in sodium iodide crystals are discussed.

271. SPECTRUM AND DECAY OF NaI. W. J. Van Sciver. Nucleonics 14, No. 4, 50-1 (1956)

NSA56-7900

272. STUDIES ON THE LINEARITY OF A SCINTILLATION GAMMA-RAY SPECTROMETER. V. O. Eriksen and G. Jenssen. Phys. Rev. 85, 150 (1952) Jan. 1
NSA52-2145

273. A STUDY OF PHOTONS IN SODIUM IODIDE SCINTILLATION CRYSTALS. C. M. Davisson and L. A. Beach. Sept. 15, 1959. Naval Research Lab., NRL-5408
NSA60-12090

274. A STUDY OF PHOTONS IN NaI(Tl) SCINTILLATION COUNTERS. L. A. Beach and C. M. Davisson. p. 41-52 of proceedings of the ANP spectroscopy information meeting held August 6-7, 1957 at Wright Air Development Center. WADC-TN-57-298 (Pt. 1)
NSA59-14273

275. STUDY OF SCINTILLATION FROM ALKALI HALIDES. J. Bonanomi and J. Rossel. Trans. from Helv. Phys. Acta 24, 310-14 (1951) AEC-tr-1776

276. SURFACE EFFECT OF SODIUM IODIDE SCINTILLATORS. E. der Mateosin and L. C. L. Yuan. Phys. Rev. 90, 868-9 (1953)
CA53-9791d

277. TECNICHE APPARECCHIATURE E DATI SPERIMENTALI PER L'ANALISI CHIMICA E RADIOCHIMICA. I. Misure quantitative con spettrometria gamma mediante scintillatori (NaI) in geometria variablie 0 $4\pi$ (Technique, apparatus, and experimental data for analytical chemistry and radiochemistry. I. Quantitative measurement with gamma spectra using NaI scintillators in variable or $4\pi$ geometry. C. Triulzi. May, 1960. Centro Informazioni Studi esperienze, Milan. CISE-74

278. THE TEMPERATURE COEFFICIENT OF SCINTILLATION PHOSPHORS. W. L. Minarik and H. G. Drickamer. Rev. Sci. Instr. 22, 704-5 (1951) Sept.
NSA51-6832

A comparison of the counting rate as function of temperature of typical sodium iodide, anthracene, and calcium tungstate crystals was made. NaI has, by far, the flattest temp. profile.

279. TEMPERATURE COEFFICIENTS OF SCINTILLATING SYSTEMS. W. P. Ball, R. Booth and M. MacGregor. Nuclear Instr. 1, 71-4 (1957) (also UCRL-4666)
CA58-7890b

280. THE TEMPERATURE DEPENDENCE OF LUMINESCENCE OF NaI: Tl CRYSTALS AT TEMPERATURES OF 0-270°C. V. I. Startsev et al. Optika i spektrosk 8, 541-4 (April, 1960) (In Russian)

SA60-13712

281. TEMPERATURE DEPENDENCE OF SCINTILLATIONS IN SODIUM IODIDE CRYSTALS. W. C. Elmore and R. Hofstadter. AECU-67. See also Phys. Rev. 75, 203-204 (1949) Jan. 1

NSA49-962

282. THALLIUM$^+$ IN ALKALI HALIDES. P. Brauer. Z. Naturforsch, 8a, 273-4 (1953)

CA53-9091d

The distribution of $Tl^+$ between alkali halide crystals slowly pptd. from their satd. solns. at 95° and the supernatant liquor was detd. for NaCl, KCl, NaBr, NaI, and KI. Many times as much $Tl^+$ pptd. with the K crystals than with the corresponding Na salts.

283. THE ENERGY LOSS OF MU-MESONS AND ELECTRONS IN NaI CRYSTALS. G. M. Snead. Univ. of Virginia. University Microfilms Pub. No. 7988 (L. C. Mic. A54-1260)

284. THERMODYNAMIC PROPERTIES OF SOME GASEOUS ALKALI HALIDES. R. L. Wilkins. J. Chem. Eng. Data, 337-42 (1960) July.

NSA60-24137

285. THERMOLUMINESCENCE AND FLUORESCENCE IN ALKALI HALIDE CRYSTALS INDUCED BY SOFT X-RAYS. S. P. Keller and J. J. Clemmons. J. Chem. Phys. 23, 586-7 1955. Mar.

NSA55-3682

286. THIN-WINDOW MOUNT FOR NaI SCINTILLATION CRYSTALS. C. D. Goodman and J. L. Need. April, 1956. Oak Ridge National Lab., ORNL-2066

NSA56-3940

287. THRESHOLD DETECTORS FOR LOW-LEVEL NEUTRON MEASUREMENTS. J. F. O'Brien. Proc. Health Phys. Soc. 1, 231-40 (1956)

CA58-12596c

A group of selected reactions and detectors have been investigated with special emphasis on methods of improving detector sensitivity (reaction and detector given): NaI(Tl) and others.

288. TOTAL ABSORPTION GAMMA RAY SPECTROSCOPY. G. T. Chapman and N. H. Lazar. Oak Ridge National Lab. p. 97-126 of proceedings of the ANP spectroscopy information meeting held Aug. 6-7, 1957 at Wright Air Development Center. WADC-TN-57-298 (Pt. 1)

NSA59-14276

A review of the pulse height distribution curves obtained at ORNL with large sodium iodide crystals.

289. TOWARDS BETTER SCINTILLATION COUNTING. D. I. Cooper and G. A. Morton. Nucleonics 14, No. 4, 46-8 (1956) A symposium.

CA56-12677a

No agreement is reached as to linearity of response of NaI. Glass photomultiplier envelopes usually exhibit phosphorescence. Some observers find gain increases with temp., others the reverse.

290. TRANSISTOR SCINTILLATION SPECTROMETER. M. G. Strauss. Argonne National Lab. Feb. 1960. ANL-6123.

Uses as a detector a thallium-activated sodium iodide crystal.

291. ULTRASONICALLY INDUCED SPIN TRANSITIONS IN SODIUM IODIDE. D. A. Jennings et al. Phys. Rev. 109, No. 4, 1059-62 (1958) Feb. 15.

SA59-591

The influence of ultrasonic vibrations on the nuclear magnetization of sodium and iodine nuclei in a single crystal of sodium iodide was examined.

292. ULTRAVIOLET ABSORPTION OF ALKALI HALIDES. J. E. Eby et al. Phys. Rev. 116, No. 5, 1099-105 (1959) Dec. 1.

SA60-2937

The absorption spectra of evaporated films of the alkali halides were measured at room temperature and 80°K in the region from 1100-2500 A.

293. USE OF DOMESTIC (RUSSIAN) PHOSPHORS FOR SCINTILLATION COUNTING. A. N. Pisarevskii and E. D. Teterin. Izvest. Akad. Nauk. S.S.S.R., Ser. Fiz. 22, 23 (1958)

CA58-7889f

294. USE OF RADIOTRACERS TO STUDY ACTIVATOR DISTRIBUTION IN ALKALI HALIDE CRYSTALS. L. M. Belyaev et al. Rost. Kristallov, Akad. Nauk. S.S.S.R., Inst. Krist. Doklady Soveshchaniya 1956, 341-4 (Pub. 1957). Growth of Crystals. Rept. 1st. Conf. Moscow, 1956, 267-9 (Pub. 1958) (English translation).

CA59-13787f

$Tl^{204}$ and $Ag^{110}$ were used as tracers to det. activator concn. in KI(Tl), NaI(Tl), Cs(Tl) and KI(Ag). The nonuniformity of activator concn. was sometimes as high as 40% in 1 cm. length. The Kyropoulos and the Obreimov-Shubnikov techniques were used. The activator concn. in the crystal increased as growth proceeded and depended on the growth rate. Annealing for 7 days redistributed the activator only moderately.

295. USE OF NaI-Tl CRYSTAL SPECTROMETERS IN THE STUDY OF GAMMA-RAY ACTIVITY IN VIVO: A SUMMARY OF DEVELOPMENTS AT THE ARGONNE NATIONAL LABORATORY. L. D. Marinelli. Measurement of body radioactivity (Conference at Leeds, England, April, 1956). British J. Radiol., Suppl. 7, (1957) p. 38-43.

CA58-2583i

The use of NaI-Tl scintillation counters, in the measurement of gamma-ray activity emitted by living persons, has proved satisfactory in a large variety of circumstances by virtue of its relatively low cost and its versatility, which in all probability cannot be met by more rapid but less informative procedures.

296. WATERPROOFING OF LUMINESCENT THALLIUM-ACTIVATED SODIUM IODIDE. E. K. Cole, Ltd. and M. J. Toogood. Brit. 796,187. June 4, 1958.

CA58-19517g

297. THE YIELDS OF GAMMA AND PHOTOLUMINESCENCES OF ORGANIC CRYSTALS. Z. A. Chizhikova and M. D. Galanin. Zhur. Eksptl i Teoret Fiz. 30, 187-8 (1956)

CA56-14369g

A table is presented showing these values for NaI(Tl) and others.

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