The creation of stars in an ...

S/056/62/043/005/057/058
B125/B104

of the density. It is assumed that the total annihilation occurs at $\Delta 1/1 = 1.5\%$. During the expansion, the tension inside the matter increases gradually, leading to the general annihilation at $t=3260$ sec. In the case of an earlier break-off at considerably reduced tension the gap widens during the expansion. A sound wave emerges from this gap and propagates into the matter, nullifying the stress at a distance of 100 km. Solid hydrogen disintegrates into pieces of ~100 km in diameter and 10^{20} g. On condition that the fluctuations occur at $\rho_0 = 0.01$, $\Delta\rho/\rho$ will reach the order of magnitude unity if the density corresponds to such a value ρ_1 that $2 \cdot 10^{-7}(\rho_1/\rho_0)^{-1/3} = 1.$ ρ_1 is then equal to 10^{-22}. This density is reached after $3 \cdot 10^6$ years. The mechanism here described is not sufficient for the origination of galactics. The strong perturbances during the origination of stars and the onset of nuclear reactions within them seem, however, to further the gravitation-induced instability in the expansion of the universe. The present paper offers no complete description of how stars are created; its most important result is the proof that the restriction to molecular fluctuations is forbidden.
Card 2/3

The creation of stars in an ...

SUBMITTED: September 13, 1962

S/056/62/043/005/057/058
B125/B104

Card 3/3

ZELDOVIC, J.; MYSKIS, A.

    Modern science instead of old scholastics. Pokroky mat fyz astr 9
    no.4:244-247 '64.

CA

Semiautomatic gas analyzer for oxygen. V. S. Chern-
yak and A. G. Zel'dovich. Zavodskaya Lab. 10, 480-8
(1941).—O is absorbed in a single stage by an alk. soln. of
Na_2SO_3 prepd. by the Zikeev method (C. A. 32, 1602[1]). 6
Height of absorbing soln. is 500 mm., time for absorption
3 min. or over.   B. Z. Kamich

ZEL'DOVICH, A.G.

The purification of liquid O from solid CO_2 by filtration. A. G. Zel'dovich. J. Chem. Ind. (U. S. S. R.) 18, No. 11, 20-21 (1941).—Porcelain filters give satisfactory results. Filters can also be prepd. from slag, but dust particles tend to get into the O when they are used.
                                        H. M. Leicester

ZEL'DOVICH, A. G.   Cand. Tech. Sci.

Dissertation: "Heat Transfer Coefficient and Hydraulic Strength of Checkered Brickwork
of Regenerators." Inst of Physical Problems, Acad Sci USSR, 27 Feb 47.

SO: Vechernyaya Moskva, Feb, 1947 (Project #17836)

ZELDOVICH, A. G.

CA

7

Heat-transfer coefficients in regenerator extensions with spiral slits. A. G. Seldovich. *Kislorod* 4, No. 3, 28–35 (1947); *Chem. Zentr.* 1948, I, 605.—Heat-transfer coeffs. were detd. with simple equipment for 3 different extensions. For an extension with a spiral slit the Nusselt no. is $3.7 + 0.90 (l/d)^{-1.44}$ times the Reynolds no., where l is the length and d the width of the air duct. The heat-transfer coeff. increases with increasing air consumption even in the region of laminar flow, it only depends little on the length to width ratio of the extension piece and it is independent of the direction of flow (upwards or downwards). T. G. G.

ZEL'DOVICH, A. G.

Jun 1947

USSR/Engineering
Heat - Transference
Nozzles

"Coefficient of Heat Transfer in Regenerative Nozzles with Spiral Apertures," A. G. Zel'dovich, 8 pp

"Kislorod" No 3

In present day air-distributing apparatus regenerative equipment is widely used. It is important to determine their capacity and dimensions. In this article the author attempts to define the size of the regenerative equipment which is necessary for efficient operation. Well illustrated, with diagrams of proposed equipment and tables of data obtained from experiments. For calculating the heat transfer coefficient in regenerative nozzles with spiral apertures the author gives a formulae, which shows a relation between Nussel's (Nu) criterion and Reynold's (Re) criterion with respect to the length and width of the air channel. Formula: $Nu = 3.7 + 0.96 \left(\frac{l}{d}\right)^{-1.43} \cdot Re$. This article appears to be a continuation of an earlier article.

22T35

DOUTCH, A. G.

USSR / Gases.

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9072   D-7

Author   : Zel'dovich, A.G.
Inst   : Institute of Physical Problems, Academy of Sciences USSR
Title   : Mercury Gas Holder.

Orig Pub : Pribory i tekhn. eksperimenta, 1956, No 1, 95-96

Abstract : The gas holder described is intended for the storage of ex-
            pensive or poisonous gases. The construction of the gas
            holder makes it possible to work at absolute or relative
            pressure of 30 -- 200 mm mercury. It is possible to remo-
            ve the gas completely from the gas holder by creating a va-
            cuum. The gas holder can be used instead of a pump for
            the transfer of small quantities of gas. Gas holders with
            a geometric capacity of 5 -- 110 liters were constructed.

Card   : 1/1

ZEL'DOVICH, A.G.

SUBJECT	USSR / PHYSICS	CARD 1 / 2	PA - 1498
AUTHOR	ZAVARICKIJ,N.V., ZEL'DOVIČ,A.G.		
TITLE	The Thermal Conductivity of Technical Material at Low Temperatures.		
PERIODICAL	Žurn.techn.fis, 26, fasc.9, 2032-2036 (1956)		
	Issued: 10 / 1956 reviewed: 10 / 1956		

An apparatus is described here which serves the purpose of measuring thermal
conductivity of solids within the range of from 2 to 100° K. By means of two
thermometers the temperature distribution along the sample to be investigated was
measured. The lower end of the sample was fitted with a pre-heater of manganite
wire, the upper end was connected with a hydrogen- or helium bath by means of a
cooling pipe. The upper end of the sample was connected with a second pre-heater,
and for the purpose of extending the range of temperature a third pre-heater was
in addition fitted. The thermometers were supplied by the firm of Allen-Bredly
and had the form of thin plates which were cut out of graphite resistances. On
both sides of these plates a layer of copper was electrolytically applied. The
immediate change of thermal conductivity consisted in the determination of the
resistances of the thermometers at different temperatures, on which occasion
successively first one and then the other pre-heater was connected. Hereby it
became possible to determine the drop of temperature along the sample. The mean
error committed on the occasion of the determination of thermal conductivity
amounted to 5% for the entire domain measured. The materials examined were
copper as well as a number of copper alloys, duraluminium, noncorroding steel,
and graphite. Measuring results are shown by diagrams. Among the samples examined
there were such with both good and bad conductivity. The heat conductivity of

graphite at helium temperatures is about 100 times less than that of non-corroding steel and a few dozen times less than that of glass. In the case of an increase of admixtures heat conductivity modifies the character of its temperature dependence from $K \sim T$ to $K \sim T^2$, and, at the same time, the absolute value of heat conductivity is diminished. K denotes the average heat conductivity. This may be explained by the assumption that a transfer of heat takes place by the electrons <u>and</u> by the lattice in the metals. At sufficiently low temperatures the electronic part of heat conductivity is proportional to T, whereas the heat conductivity of the lattice in the metals is apparently proportional to T^2 because of phonon scattering on the electrons. In the case of pure metals the heat conductivity of the lattice in relation to the electron part of heat conductivity can be neglected because of its insignificance. However, in the case of alloys, heat transfer by the lattice begins to attain importance because the electron part diminishes.
In conclusion the results obtained are compared with those obtained by other works.

INSTITUTION: Institute for Physical Problems S.I.VAVILOV, Moscow.

SOV-120-58-1-6/43

AUTHORS:Belonogov, A. V., Zel'dovich, A. G., Kolganov, V. Z.,
Landsberg, L. G., Lebedev, A. V., Nikitin, S. Ya.,
Smolyankin, V. T., Sokolov, A. P.

TITLE: A Photographic Setup for Large Hydrogen Bubble Chambers
(Sistema fotografirovaniya dlya bol'shikh vodorodnykh
puzyr'kovykh kamer)

ABSTRACT: A photographic setup for hydrogen bubble chambers of
large dimensions is quite different from that for Wilson
and diffusion chambers. In particular, a gas bubble in
liquid hydrogen scatters light mainly in the forward dir-
ection, most of it between 0 and 10°, say (cf Fig.1) so
that it is impossible to photograph the tracks at 90° to
the incident light as is done in the usual chambers. For
small bubble chambers the photographs may be taken with
direct transmission in which the source of light is on the
one side of the chamber and the photographic camera on the
other (Refs.3-5). However, it is very difficult to use
this system with a large hydrogen chamber since it is des-
irable not to employ large glasses as it is difficult to
mount these on the main body of the chamber. The present

SOV-120-58-1-6/43

A Photographic Setup for Large Hydrogen Bubble Chambers.

authors have therefore developed a method of illuminating and photographing on one side of the chamber only. This method was tried on the working hydrogen chamber described in Ref.5 (this issue) and is shown in Fig.2. The back wall of the chamber was in the form of a spherical mirror, at the centre of curvature of which the source of light was placed. The light reflected from this mirror is focussed back again at the source and does not enter the objective of the photographic camera (B in Fig.2). The light which after reflection is scattered by the bubbles does enter the photographic camera and gives rise to the track images (Fig.3, facing p.35). The main disadvantage of this method is that in addition to the real images one gets the virtual images as well but these can be recognised by inspection or by a measurement of track co-ordinates by means of 2 stereophotographs (the virtual image lies behind the mirror). A calculation of the scattered light as a function of angle,

Card 2/3

SOV-120-58-1-6/43

A Photographic Setup for Large Hydrogen Bubble Chambers.

the result of which is shown in Fig.1, is given in a
mathematical appendix. There are 5 diagrams, no tables and
7 references, of which 4 are English and 3 Soviet.

SUBMITTED: June 3, 1957.

1. Bubble chambers--Equipment   2. Particles--Photographic analysis
3. Photography--Applications

Card 3/3

ZEL'DOVICH, A. G.

14(1)

SOV/67-59-6-1/26

AUTHORS: Malkov, M. P., Doctor of Technical Sciences, Zel'dovich,
A. G., Doctor of Technical Sciences, Fradkov, A. B., Candidate
of Technical Sciences, Danilov, I. B., Candidate of Technical
Sciences

TITLE: Separation of Deuterium From Hydrogen by Means of the Low-
temperature Distillation Method

PERIODICAL: Kislorod, 1959, Nr 6, pp 1 - 13 (USSR)

ABSTRACT: The method mentioned in above title proved to be the most
suitable and economical one for the production and prepara-
tion of deuterium. It was worked out and first applied on a
large industrial scale in the USSR. In the present paper, a
survey of the present state and problems connected with it
in the USSR and abroad is given on the basis of published data.
The main schemes of deuterium separation plants are represented
and described in figures 1 and 2. The following problems are
dealt with: rectification, heat emission, heat insulation,
purification of hydrogen from impurities, and realization
of the method in industry. There are 15 figures and 27 refer-
ences, 8 of which are Soviet.

Card 1/1

PHASE I BOOK EXPLOITATION   SOV/5634

Malkov, M. P., A. G. Zel'dovich, A. B. Fradkov, and I. B. Danilov

Vydeleniye deyteriya iz vodoroda metodom glubokogo okhlazhdeniya
   (Separation of Deuterium From Hydrogen by the Method of Deep
   Freezing) Moscow, Gosatomizdat, 1961.   150 p.   Errata slip
   inserted.   4,000 copies printed.

Ed.: N. A. Korobtsova; Tech. Ed.: Ye I. Mazel'.

PURPOSE : This book is intended for scientists working on problems
   of heavy water production, scientific and technical personnel
   working on deep freezing problems and separation of isotopes,
   instructors and advanced students.

COVERAGE: The book deals with the physical and technical principles
   of deuterium separation from hydrogen by the deep freezing method.
   The specificity of liquid hydrogen rectification is described along
   with methods for the production of cold at the temperature level
   of liquid hydrogen. The physicochemical constants of hydrogen
   isotopes are presented in a form that is easy to use. The material
Card 1/5

Separation of Deuterium (Cont.)   SOV/5634

is based on works of the individual authors, as well as on works
of Soviet and non-Soviet scientists. The tabular data in the
appendix are based on the works of non-Soviet scientists. No
personalities are mentioned. There are 134 references: 79 English,
35 Soviet, 15 German, 3 French, 1 Czech, and 1 Polish.

TABLE OF CONTENTS:

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Separation of Deuterium (Cont.)

Card 3/5

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Separation of Deuterium (Cont.)   SOV/5634

AVAILABLE: Library of Congress

Card 5/5   JA/dwm/jw
                                                      9-29-61

89747

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s/064/61/000/002/001/001
B101/B206

AUTHORS: Buyanov, R. A., Zel'dovich, A. G., Pilipenko, Yu. K.

TITLE: Some problems of catalytic production of liquid p-hydrogen

PERIODICAL: Khimicheskaya promyshlennost', no. 2, 1961, 105-108

TEXT: Three methods of incorporating reaction vessels for catalytic produc-
tion of p-hydrogen into the system of a hydrogen-liquefying plant are des-
cribed. In the introduction, the purpose of producing $p-H_2$ is explained
(long durability owing to low evaporation losses), as well as the use of
hydrogen for producing deuterium, as charge for targets and bubble chambers
and as rocket fuel. The three methods of incorporating reaction vessels
are shown diagrammatically. Schemes a and b were elaborated at the
kriogennaya laboratoriya (Cryogenic Laboratory) of the authors' Institute.
Scheme b was proposed by A. B. Fradkov. In the liquefier of the type a, the
hydrogen leaving the heat exchanger (1) of the cold zone under high pressure
is branched into two currents. One part enters into the collecting vessel
(4) for H_2 of normal composition $(n-H_2)$ through throttle valve (8). The other
part entering into cooling coil (3) through throttle valve (9) is liquefied
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Some problems of ...

entirely and supercooled owing to the effect of partial evaporation of n-H_2 in (4). From (3) H_2 enters into reaction vessel (2), where it is converted into p-H_2. Evaporation and heating by 3-4°K sets in owing to the liberated heat of conversion. Dissipation of the heat of conversion and reliquefaction takes place in cooling coil (3). The pressure in the cooling coils is regulated by throttle capillaries. The p-H_2 flows through (10) into the collecting vessel (5), from where it is filled into Dewar vessels through valve (6). The n-H_2 vapor is drawn off through the countercurrent tubes of the heat exchanger. This variant does not warrant an isothermal course of the process and is therefore only suitable for the production of 92-93% p-H_2. In the type 6, reaction vessel (2) is designed as a coil and immersed into the collecting vessel (4) for n-H_2. Heat dissipation occurs not only in (3) but also through the walls of (2). This variant permits the production of 99.7% p-H_2. The hydrogen enters from (1) through valve (8) into the collecting vessel (5), where a pressure of 1.8 to 3.0 kg/cm^2 is maintained a helium valve (11). The vapor and the liquid n-H_2 flow through (11) into the collecting vessel (4), where the pressure is 0.5 kg/cm^2, and is led back to

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B101/B206

Some problems of ...

(1). The liquid H_2 enters from (5) into reaction vessel (2) and cooling coil (3), and is drained off as p-H_2 by means of valve (6). In the variant 6, the reaction vessel (2) is fed by a separate line with H_2 enriched with 49% p-H_2. The n-H_2 circulates separately and serves only as cooler. The H_2 to be converted is purified in adsorbers filled with active carbon and cooled by liquid N_2. Partial conversion into p-H_2 sets in already here. Possibilities of incorporating such reaction vessels into existing hydrogen-liquefying plants are discussed, and it has been found that type 6 is suited for liquefiers of high and low capacity. Type 6 is suited for liquefiers of medium capacity (100-300 l/hr), which operate according to the refrigeration system. Type a is recommended for incorporation into liquefiers, where difficulties would arise when incorporating type 6. The following optimum conditions are given on the basis of experimental data (Refs. 2-5): charge of the reaction vessel with 30-120 g/hr of H_2 per cm^2 of cross section. The capacity of the liquefier drops by 33 to 35% when producing p-H_2. Chrome-nickel catalysts, $Fe(OH)_3$, $Cr(OH)_3$, and $Mn(OH)_4$ are mentioned as catalysts. As the Cr-Ni catalyst is difficult to activate (Refs. 4, 5) and can easily be poisoned by

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O_2, it is only recommended for continuous operation. The hydroxide cata-
lysts are activated at 0.1 mm Hg by heating them at 95 to 105°C for 24 hr.
The poisoning by O_2 is reversible. If these catalysts are filled into the
reaction vessel immediately after heating, their activity is reduced, so
that twice as much must be taken. They can, however, be reactivated without
heating, only in a vacuum. The required amount of the catalyst is calculated
from the equation:

$$V_H/V_k = 44.7K \left\{ \log \left[(1 - C_o/C_p)/(1 - C/C_p) \right] \right\},$$ where V_H is the given capacity
of the installation (1 p-H_2 per hr, with concentration C); V_k is the re-
quired volume of the catalyst, cm^3; C_o is the initial concentration of p-H_2
(25% as a rule); C_p is the equilibrium concentration of p-H_2 at the working
temperature (99.8% as a rule); and K is the rate constant of the conversion
reaction. The values of K for various catalysts are given in a table. There
are 1 figure, 1 table, and 8 references: 5 Soviet-bloc and 3 non-Soviet-
bloc.

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Some problems of ...

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute
of Nuclear Research)

Legend to Figure: v/vacuum
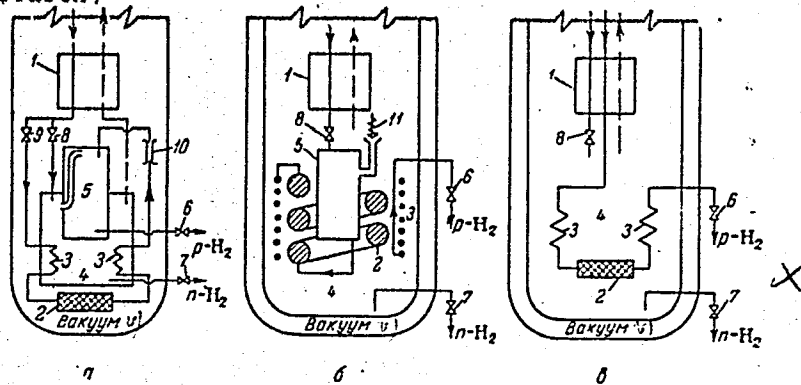
Legend to Table: 1) constants
$K \cdot 10^3$ g-mole/cm^3·sec; 2) catalysts;
3) chrome-nickel.
Card 5/5

Катализаторы	Константы $K \cdot 10^3$, г-моль/см³·сек	
	76°K	22°K
Хромоникелевый	1,5—1,7	1,6—2,1
Fe(OH)₃	1,0—2,3	0,9—2,1
Cr(OH)₃	0,56—0,74	0,9—1,6
Mn(OH)₄	0,73—1,2	1,6—2,1

BUYANOV, R.A.; ZEL'DOVICH, A.G.; PILIPENKO, Yu.K.

Liquifier for producing parahydrogen and catalizers for the
ortho-para conversion of hydrogen. Prib. i tekh. eksp. 6 no.2:
188-190 Mr-Ap '61.   (MIRA 14:9)

1. Ob"yedinennyy institut yadernykh issledovaniy.
        (Gases--Liquifaction) (Hydrogen)

L 20840-66   EWP(t)   IJP(c)   WW/JW/JD

ACCESSION NR: AT5009454   Cz/0000/64/000/000/0172/0178

AUTHOR: Zeldovich, A. G.; Pilipenko, Yu. K.

TITLE: Large laboratory hydrogen liquifier VO2 for use with large liquid hydrogen bubble chambers

SOURCE: Conference on Low Temperature Physics and Techniques. 3d, Prague, 1963. Physics and techniques of low temperatures; proceedings of the conference. Prague, Publ. House of the Czechosl. Academy of Sciences, 1964, 172-178

TOPIC TAGS: bubble chamber, liquid hydrogen, para hydrogen, liquefaction technique, cryogenic device

ABSTRACT: The apparatus described is a Joule-Thomson liquifier based on a registered invention by the authors (Byulleten' izobretenly No. 19 (1960), 18), and a smaller version was described by the authors earlier (PTE no. 2 (1961), 185 and no. 4 (1963), 191). A diagram of the liquifier is shown in Fig. 1 of the Enclosure. Its rated capacity is 200 liters of para-hydrogen per hour. The considerations governing the choice of some of the components of the equipment are discussed. Tables listing different characteristics for para-hydrogen production in the liquifier and of the design calculations are presented. Calculations based on the ex-

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L 20840-66

ACCESSION NR: AT5009454   6

perimental results show that the liquifier can work with 1500 m^3/hr of compressed hydrogen and hence can produce 460 and 200 liters/hour of normal and para-hydrogen, respectively. "The authors thank N. K. Zel'dovich, A. A. Belushkina, L. P. Belonogova, A. A. Demin, and O. O. Khorev who took part in the design and assembly of the liquifier." Orig. art. has: 2 figures and 2 tables.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: 00   ENCL: 01   SUB CODE: NP

NR REF SOV: 004   OTHER: 002

Card 2/3

L 20840-66

ACCESSION NR: AT5009454
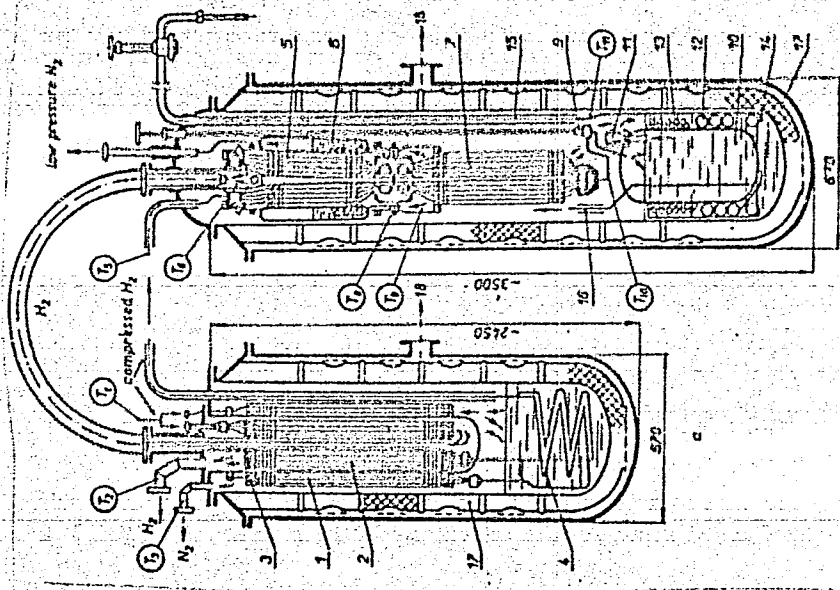
Fig. 1. The liquefier VO2:

1 — nitrogen section of exchanger "hot" zone, 2 — hydrogen section of exchanger "hot" zone, 3 — fittings, 4 — coil in liquid nitrogen bath, 5 — heat exchanger of "intermediate" zone, 6 — nitrogen low pressure bath, 7 — heat exchanger "cold" zone, 9 — throttle valve, 10 — subsidiary collector, 11 — pneumatic valve, 12 — reactor, 13 — condensing coil, 14 — supplementary reactor, 15 — outlet valve for para-hydrogen, 16 — outlet valve for normal hydrogen, 17 — Dewar flask, 18 — To the vacuum pump.

Card 3/3

L 27234-66   EWT(m)   IJP(c)

ACC NR: AP6009521   SOURCE CODE: UR/0413/66/000/005/0044/0045

AUTHORS: Zel'dovich, A. G.; Kozubai, E. V.

ORG: none

TITLE: Bubble chamber. Class 21, No. 179390 /announced by United Institute for Nuclear Studies (Ob"yedinennyy institut yadernykh issledovaniy)/

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 5, 1966, 44-45

TOPIC TAGS: bubble chamber, nuclear physics apparatus

ABSTRACT: This Author Certificate describes a bubble chamber consisting of a chamber surrounded by a vacuum mantle to which the windings of the electromagnet, the photographic and illuminating systems, and the shielding installation are fastened. To decrease the optical inhomogeneity of the liquid occupying the ballast volume of the chamber by cooling, the ballast chamber is equipped with a cooling coil. To prevent supercooling of the liquid in the working chamber, a heater is installed between the ballast and working chamber (see Fig. 1).

Card 1/2   UDC: 539.188.073.3

L 27234-66

ACC NR: AP6009521
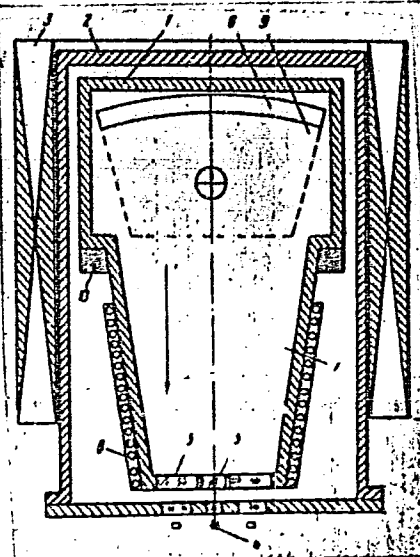
Fig. 1. 1 - body of chamber; 2 - mantle; 3 - windings of electro-magnet; 4 - light source; 5 - glass illuminators; 6 - reflecting device; 7 - ballast chamber; 8 - cooling coil; 9 - working chamber; 10 - heater.

Orig. art. has: 1 figure.

SUB CODE: 18/   SUBM DATE: 22Aug64

Card 2/2   CC

and more hydrogen, respectively (described at the 1961 Conference on Low Tempera

ZEL'DOVICH, A.G.; PILIPENKO, Yu.K.

Improvement and acceleration of a VO1 hydrogen liquiefier. Prib.
i tekh. eksp. 8 no.4:191 Jl-Ag '63.   (MIRA 16:12)

1. Ob"yedinennyy institut yadernykh issledovaniy.

temperature physics and engineering.

1/3

Ch. XI. Methods of cleaning gases -- 291
Th, XII. Gas liquefaction -- 292

ZEL'DOVICH, A.G.; PILIPENKO, Yu.K.

Hydrogen liquifier with an output of 50 liter per hour of liquid
hydrogen. Prib. i tekh. eksp. 6 no.2:185-187 Mr-Ap '61.
(MIRA 14:9)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Gases--Liquifaction) (Hydrogen)

1. BOBKOV, A.M., Eng., ZEL'DOVICH, A. L., Eng.

2. USSR (600)

4. Loading and Unloading

7. L'vov plant should produce high quality truck loaders. Mekh. trud. rab. 7, No. 1, 1953.

9. Monthly List of Russian Accessions, Library of Congress, _____ May _____ 1953, Unclassified.

GREKH, I.F.; ZEL'DOVICH, D.R.; BOGNIBOV, Ye.A.

Effect of radiotherapy on the content of some electrolytes in
erythrocytes, blood plasma and urine of patients with cancer of
the cervix uteri. Med. rad. 9 no.2:52-56 F '64.

(MIRA 17:9)

1. 3-ye khirurgicheskoye otdeleniye (zav.- prof. V.P. Tobilevich)
i kliniko-diagnosticheskaya laboratoriya (zav.- dotsent I.F. Grekh)
Instituta onkologii AMN SSSR.

ZEL'DOVICH, B.

    Radiation of open resonators. Izv.vys.uchab.zav.; radiofiz. 8
no.3:522-530 '65.   (MIRA 18:8)

1. Moskovskiy gosudarstvennyy universitet.

L 6964-65 EPF(c)/EWT(1)/   IJP(c)/   GG/WW
ACC NR: AP5020364   SOURCE CODE: UR/0141/65/008/003/0522/0530

AUTHOR: Zel'dovich, B.   41

ORG: Moscow State University (Moskovskiy gosudarstvennyy universitet)   B

TITLE: Radiation in open resonators

SOURCE: IVUZ. Radiofizika, v. 8, no. 3, 1965, 522-530

TOPIC TAGS: resonator, quantum resonance phenomenon, wave function, Cauchy problem

ABSTRACT: The modes of an open resonator are described by means of continuous
spectrum wave functions of the type $\psi_{\vec{k}}$ developed in quantum mechanics. The modes
themselves do not produce a complete orthogonal system. The ratio of the resonant
to the nonresonant term in the selected functions is calculated. The limiting case
of transition to an ideal closed resonator is presented. The field is broken down
into oscillators and a system of wave functions for the continuous spectrum is se-
lected. It is assumed that absorption by resonator walls does not take place and
that the attenuation of the frequency modes is determined only by the radiation

UDC: 621.372

Card 1/2

L 6964-66

ACC NR: AP5020364

leaving the system. Properties of wave functions for the quasi-stationary states are considered in terms of the total system of functions. In this case the principal feature is the absence of spherical symmetry in an open resonator. The system of functions is also used to solve the Cauchy problem and the problem of external excitation at a given frequency. By displacing the integrating loop the resonant terms corresponding to the natural oscillations of the field are isolated. The method can be used to consider the forms of the spectral line for the spontaneous and induced radiations of an atom in an optical resonator. Orig. art. has: 25 formulas, 1 figure.

SUB CODE: GP/   SUBM DATE: 20Jul64/   ORIG REF: 004/   OTH REF: 000

Card 2/2

ZEL'DOVICH, B.Ya.; OKUN', L.B.

Possible nonconservation of the CP-parity and the nature of the rule $\Delta T = 1/2$. IAd. fiz. 2 no.1:198-199 Jl '65.   (MIRA 18:2)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

ia

L 3914-66
ACCESSION NR: AT5022319

9

tain qualitative estimates of the scale of nonconservation of CP parity in ampli-
tudes with $\Delta T = 1/2$, 3/2, and 5/2 are made. From the observed probability of the
decay $K_2^0 \to 2\pi$ it follows that CP-odd corrections to amplitudes with $\Delta T = 1/2$ amount
to 10^{-3} (or even 10^{-4}). CP-odd corrections to amplitudes with $\Delta T = 3/2$ may be of
the order of 2%, and to amplitudes with $\Delta T = 5/2$, about 10^{-2}% if the transitions
from $\Delta T = 3/2$ and $\Delta T = 5/2$ are comparable. "The authors are deeply grateful to I.
Yu. Kobzarev, I. Ya. Pomeranchuk, and M. V. Terent'yev for many useful discussions
of the problems touched upon in the paper." Orig. art. has: 1 figure, 4 formulas.

ASSOCIATION: none

SUBMITTED: 22Mar65   ENCL: 00   SUB CODE: GP, NP

NO REF SOV: 002   OTHER: 007

Card 2/2

BASHKATOV, T.V.; ZEL'DOVICH, G.N.; NIKANDROV, A.P.

Economic analysis of the prospects for the development of the
synthetic rubber industry. Zhur.VKHO 9 no.1:65-70 '64.
(MIRA 17:3)

15(2)
AUTHOR: Zel'dovich, I. Ya.   SOV/72-59-8-13/17

TITLE: Changed Design of the Connecting Channel of Glass Furnaces
                    (Izmeneniye konstruktsii protoka steklovarennykh pechey)

PERIODICAL: Steklo i keramika, 1959, Nr 8, pp 44-46 (USSR)

ABSTRACT: The Kherson glass container plant has two tank furnaces
                    operating on fuel oil. In 1958 furnace Nr 2 was reconstructed.
                    The lining of the connecting channel as it is shown in figure 1,
                    consisting of fire-clay beams, was exposed to great wear (Fig 2).
                    On the suggestion of Chief Engineer A. A. Safronov of the plant
                    the lining of the connecting channels was made of mullite beams,
                    and the channel as such was laid out as a dual channel, as can
                    be seen in figure 3. Furnace Nr 2 has been working faultlessly
                    for 11 months, furnace Nr 1 for 7 months. Conclusion: It is
                    advantageous to use mullite beams instead of the fire-clay beams
                    used so far for the lining of connecting channels. Mullite beams
                    have proven their practical value in operation. It would be
                    desiderable to have mass production of mullite adapting beams
                    for connecting channels. There are 3 figures.
ASSOCIATION: Khersonskiy steklotarnyy zavod (Kherson Glass Container Plant)
Card 1/1

PA 0T47

ZELDOVICH, J. Z.

USSR/Detonation - Waves   Mar 1947

"On the Reflection of a Plane Detonation Wave,"
J. Z. Zeldovich, K. P. Staniukovich, 2 pp

"CR Acad Sci" Vol LV, No 7

Study of the reflection front of a strong detona-
tion wave from an absolutely unyielding wall to
obtain formulae for pressure and density.

8T47

AUTHORS: Polukhin, P. I., Professor, Doctor of Technical Sciences, Golubchik, R. M., Zel'dovich, L. S., Engineers

TITLE: Determination of the contact surface between metal and rolls during piercing

PERIODICAL: Stal', no. 7, 1961, 626 - 629

TEXT: The metal pressure on the rolls during diagonal and longitudinal rolling can only be defined analytically when the contact surface between the metal and the roll is known. The calculation given by A. I. Tselikov [Ref. 3: Prokatnyye stany (Roll Stands), Metallurgizdat, 1946] for this contact surface in diagonal rolling does not supply sufficiently accurate data (as a rule lower values are obtained than the actual ones) in spite of applying corrections, because the ovalization of the billet section in the focus of deformation is not taken into consideration. When making allowance for this ovalization during rolling, before piercing and the displacement (s_x) of the section caused by the feed, an analytical formula can be established (Fig. 2) with which it is possible to determine the contact surface in any section of the deformation focus before the billet comes

Card 1/4

Determination of the contact surface between...
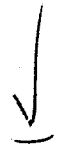
Into contact with the mandrel:

$$b_{x+s} = \sqrt{\frac{D_{x+s}^2}{4} - \left[\frac{D_{x+s}}{2} - \frac{\xi_x^2 d_x^2 - d_{x+s}^2}{4(D_{x+s} + d_{x+s})}\right]^2} \qquad (5)$$

where: b_{x+s} = the width of the contact surface before piercing, in the x+s section, mm; D_{x+s} = diameter of the roll in the same section, mm; d_{x+s} = diameter of the billet in the x+s section, mm; d_x = ditto, in section x, mm; ξ_x = coefficient of ovalization in section x. When not considering the effect of the incline angle of the roll, the distance between the roll axes can be regarded as being constant for the entire length of the deformation focus and in that case:

$$D_x + d_x = D_{x+s} + d_{x+s} = \ldots = const. = D_n + b \qquad (9)$$

D_n = roll diameter at the neck [Abstracter's note: subscript n (neck) is the translation of the Russian п (perezhim)]; b = distance between the rolls at the neck. By using $D_n + b$ instead of $D_{x+s} + d_{x+s}$ and $D_{x'+s'} + d_{x'+s'}$, the final equation for rolling without piercing will be:

Card 2/4

Determination of the contact surface between...

$$b_{x+s} = \sqrt{\frac{D_{x+s}^2}{4} - \left[\frac{D_{x+s}}{2} - \frac{\xi_x^2 d_x^2 - d_{x+s}^2}{4 \cdot (D_n + b)}\right]^2} \qquad (10)$$

and for rolling with mandrel (while making allowance for the displacement of the section after meeting the mandrel):

$$b_{x'+s'} = \sqrt{\frac{D_{x'+s'}^2}{4} - \left[\frac{D_{x'+s'}}{2} - \frac{\xi_{x'} d_{x'}^2 + \delta_{x'+s'}^2 - \delta_{x'}^2 - d_{x'+s'}^2}{4(D_n + b)}\right]^2} \qquad (11)$$

(where: $\delta_{x'}$, $\delta_{x'+s'}$ = the diameters of the mandrel in the x' and x'+s' sections). The correctness of the formulae given was proved by comparing the results with those obtained by Tselikov's method as well as with values actually measured. The calculation principles used for barrel-shaped rolls can also be applied to other types of diagonal rolling, for instance, to disk-shaped or tapered rolls. There are 5 figures, 2 tables and 5 Soviet-bloc references.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

Card 3/4

POLUKHIN, P.I.; OSADCHIY, V.Ya.; GOLUBCHIK, R.M.; ZEL'DOVICH, L.S.

Determination of axial forces acting on a piercing mill mandrel.
Izv.vys.ucheb.zav.; chern.met. 4 no.5:102-108 '61. (MIRA 14:6)

1. Moskovskiy institut stali.
          (Rolling mills—Equipment and supplies)

S/148/61/000/005/004/015
E113/E180

AUTHORS: Poluchin, P. I., Osadchiy, V. Ya., Golubchik, R. M., and Zel'dovich, L. S.

TITLE: Determination of axial forces acting on the mandrel of a piercing mill

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1961, No.5, pp. 102-108

TEXT: The purpose of this work is to give an analytical formula for the determination of axial forces acting on the mandrel of a piercing mill. To derive this formula statics and mathematical calculus are applied. The axial forces Q_I, Q_{II}, Q_{III} acting on the mandrel in each region are expressed in terms of the geometry of the mandrel, the friction coefficient existing between the metal surface and the mandrel, and the reaction forces from the rollers. Fig.1 shows the force diagram for the determination of axial forces acting on the mandrel according to N.D. Lomakin (Ref.5: N.D. Lomakin, "Determination of the axial forces acting on the mandrel of a piercing mill. Metal working by pressure", Collected articles under the editorship of N.P. Gromov, issue IV, 1956).

Card 1/ 5

Determination of axial forces......   S/148/61/000/005/004/015
                                        E113/E180

In order to find the resultant of these forces for any shape that
the generating curve of the mandrel may have, they are considered
when acting on an elementary part of the generating curve. As an
example the axial forces Q_t and Q_{ll} are calculated for a mandrel
having spherical shape, using the theoretical approach developed.
Axial force Q_{lll} can be calculated from considerations of statics
as in the region where it acts the generating curve of the mandrel
is a straight line. It is necessary to note that not all of the
force from the rolls is transmitted to the mandrel, but part of it
is absorbed by the plastic bending of the walls of the rough-
pierced tube. According to N.D. Lomakin the force necessary for
plastic bending can be calculated according to the formula:

$$dP_{bending} = 0.8k_f \cdot \frac{(d_x - d'_x)^2}{d_x - d'_x} \, dx$$

where: k_f - resistance to plastic deformation; d_x, d'_x - external
and internal diameters of the rough pierced tube at the section x.
This formula is applied in the present work and with its aid, the
Card 2/5

Determination of axial forces.....   S/148/61/000/005/004/015
                                        E113/E180

final form of formulae for the axial forces is derived. To check
the correctness of the derived formulae, experiments have been
carried out at Yuzhnotrubnyy zavod, one of the Soviet tube mills.
In these experiments, the axial forces were measured for various
cone angles of the rolls and various reductions at the tip of the
mandrel. For the same values, the axial forces were calculated by
means of the derived formula and are tabulated. Fairly good
agreement between the theoretical and calculated values of axial
forces can be observed.   P.T. Yemel'yanenko, S.I. Borisov and
A.I. Tselikov are mentioned in the paper.
There are 3 figures, 1 table and 5 Soviet references.

ASSOCIATION: Moskovskiy institut stali
             (Moscow Steel Institute)
SUBMITTED: July 1, 1960

Card 3/ 5

_____, _____, KOROCHKIN, S.B., KOZMIN, Y.F., VASILIYEV, A.A.,
RUBCHINSKIY, S.M. (U.S.S.R.)

Measurements of the instantaneous values of the
dynamic characteristics in proton synchrotrons

CERN-Symposium on High Energy Accelerators and Pion
Physics

Geneva 11-23 June 56
In Branch #5

RUBCHINSKIY, S.M.; ZEL'DOVICH, M.P.; KUROCHKIN, S.S.

Measurement of the instantaneous values of changing magnetic field
intensities. Radiotekh. i elektron. i no.7:1001-1013 Jl '56.

(MLRA 10:1)

(Nuclear magnetic resonance)
(Synchrotron)

ZELDOVICH, M.P., RUBCHINSKIY, S.M., VASIL'YEV, A.A., KUZMIN, V.F., KUROCHKIN, S.S.

"Measurement of Instananeous Values of Variable Magnitude in Proton Synchrotron Technique," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

SOV-120-58-1-11/43

AUTHORS: Kurochkin, S. S. and Zel'dovich, M. P.

TITLE: Application of Nuclear Resonance to Magnetic Measurements on a Synchrophasotron (Primeneniya yadernogo rezonansa pri magnitnykh izmereniyakh na sinkhrofazotrone)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1958, Nr 1, pp 50-53 (USSR)

ABSTRACT: An account is given of the application of nuclear magnetic resonance to magnetic measurements on an experimental 180 MeV synchrophasotron. In this experimental synchrophasotron the magnetic field varied between 400 and 10 500 oersted with a speed of 20 x 10^3 oersted per sec $\pm 3.5\%$. Variations in the speed of the change in the magnetic field were up to 20% and the non-uniformity of the field was 3.6 x 10^{-3}cm^{-1}. A number of circuits were developed for the recording of the nuclear magnetic resonance signal (Fig.1). The first two circuits in Fig.1 are used in the measurement of fields between 300 and 3000 oersted. The second of these circuits makes possible a remote control of the sensitivity. The third circuit in Fig.1 was used in the measurements of fields greater than 3000 oersted. The specimen used was water with 1% admixture of $MnCl_2$ or $Fe(No_3)_3$. A general picture of the apparatus is shown in Fig.2. The stability of the resonance

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SOV-120-58-1-11/43

Application of Nuclear Resonance to Magnetic Measurements on a Synchrophasotron.

signals at 400 oersted was checked by having two identical
setups. Over many days the difference between the two was
never more than ±0.05% at 400 oersted and correspondingly
better for higher fields. The apparatus was used on the
synchrophasotron for the following purposes: (1) the deter-
mination of the law connecting the intensity of the magnetic
field and the frequency of the accelerating voltage (Ref.1)
and the verification of the stability of this relationship;
(2) calibration in absolute units of the apparatus produc-
ing the magnetic field; (3) verification of the stability
of this apparatus; (4) measurement of radial and asimuthal
nonuniformity of the magnetic field; (5) measurement of the
coefficient $n = rdH/Hdr$ in different sections of the
electromagnet; (6) studies of the stability of the relation
between instantaneous values of the field in the different
parts in the gap of the electromagnet; (7) verification of
the stability of the relation between the fringe field and

Card 2/3

SOV-120-58-1-11/43

.Application of Nuclear Resonance to Magnetic Measurements on a
Synchrophasotron.

the field in the gap. The following persons collaborated:
S. M. Rubchinskiy, A. M. Golubev and N. V. Kovalev. There
are 5 figures, 4 tables and 4 references, one of which is
English and the rest Soviet.

SUBMITTED: July 1, 1957.

1. Synchrophasetrons--Magnetic properties   2. Nuclear magnetic
resonance--Applications   3. Magnetic fields--Measurement

Card 3/3

SOV-120-58-1-13/43

AUTHORS: Zel'dovich, M. P. and Rubchinskiy, S. M.

TITLE: A Device for Measuring the Azimuthal Symmetry of the Field of Powerful Electromagnets (Izmeritel' azimutal'noy simmetrii polya moshchnykh elektromagnitov)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1958, Nr 1, pp 56-58 (USSR)

ABSTRACT: In order to study experimentally the intensity of the magnetic field in the gap of the electromagnet of the 680 MeV phasotron at the United Institute for Nuclear Studies, a special device was developed which can be used to determine rapidly the azimuthal symmetry in the median plane of the gap. When working the machine produces a magnetic field of 10-16 kOer while the maximum allowable deviation of the field from the average at the orbit is 0.5%. For this reason the instrument must have a sensitivity sufficient to be able to show changes less than 0.05% in the magnetic field. The device uses the variation of the magnetic permeability with magnetic field. Carbonyl iron was chosen as the working substance. The electronic circuit of the instrument is shown in Fig.1. The characteristic $\mu(H)$ was obtained using a high frequency oscillator. A coil whose core was made of carbonyl iron was

Card 1/3 a part of the circuit of a valve oscillator and the change

SOV-120-58-1-13/43

A Device for Measuring the Azimuthal Symmetry of the Field of
Powerful Electromagnets.

in μ was obtained from the change in the frequency of the
output from the oscillator. In order to increase the sensi-
tivity of the method, the method of beats was employed
(cf.Fig.1). The beats were obtained between the above
oscillator and a quartz oscillator. The change in the beat
frequency ΔF as the probe is displaced from a field H
into a field $H + \Delta H$ is given by:

$$\Delta F = \alpha \Delta H \quad \text{or} \quad \Delta H = \Delta F / \alpha$$

where α is the sensitivity. The dependence of α on H
is shown in Fig.2 and is roughly linear. A photograph of
the device is shown in Fig.3. Fig.4 shows results of mea-
surements of $\Delta H/H$ in per cent as a function of azimuth
for different radii of the electromagnet of the phasotron.
These curves show that the azimuthal symmetry of the magnet-
ic field of the electromagnet of the phasotron is not worse

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SOV-120-58-1-13/43

A Device for Measuring the Azimuthal Symmetry of the Field of
Powerful Electromagnets.

than 0.3% within a radius of 250 cm. F. A. Kuzin assisted
in the construction of the instrument. There are 4 figures,
and no references.

SUBMITTED: June 15, 1957.

1. Particle accelerators--Electromagnetic properties   2. Electro-
magnetic fields--Measurement   3. Electromagnets--Testing equipment

TITLE: Phasotrons

Card 3/3

L -L' Uöv 〰 , M.-ſ.

"On Measuring the Instantaneous Intensity Values Upon Vary-
ing the Magnetic Fields," by S. M. Rubchinskiy, M. P. Zel'do-
vich, and S. S. Kurochkin, Radiotekhnika i Elektronika, No 7,
Jul 56, pp 1001-1013

   A method of measuring the instantaneous value of intensity on vary-
ing the magnetic field was investigated and its results described (article
is dated 25 June 1956).

   The method of measuring was based on the phenomenon of nuclear mag-
netic resonance, and a device was developed suitable for the 10 Bev syn-
chrophasotron at the Electrophysics Laboratory of the Academy of Sciences
USSR.

SUM. 1305

ZEL'DOVICH, M.P

KUROCHKIN, S.S.; ZEL'DOVICH, M.P.

Using nuclear resonance in magnetic measurements on proton-synchrotrons.
Prib. i tekh. eksp. no.1:50-53 Ja-F '58.   (MIRA 11:4)
        (Synchrotron) (Nuclear magnetic resonance)
        (Magnetic fields--Measurement)

ZEL'DOVICH, M.P.; RUBCHINSKIY, S.M.

Instruments for measuring azimuthal symmetry of high-power electromagnets
Prib. i tekh. eksp. no.1:56-58 Ja-F '58.   (MIRA 11:4)
          (Magnetic fields--Measurement)
          (Electronic measurements)

ZEL'DOVICH, N. P.

Technology

Organizatsiia remonta sudov morskogo flota (Organization of naval ship repair). Moskva,
Morskoi transport, 1951. 448.p.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

ZEL'DOVICH, M. S.

Econimic principles applied to grain sovkhoz management. Moskva, Gos. izd-vo
sel'khoz i kolkhozno-ko-operativnoi lit-ry, 1931. 95 p.

Cyr.4 HD261

BAYATYAN, G.L.; ZEL'DOVICH, O.Ya.; LANDSBERG, L.G.

Cherenkov threshold gas counter operating in a wide range of
angles. Prib. i tekh. eksp. 9 no.4:87-89 Jl-Ag '64.

(MIRA 17:12)

1. Fizicheskiy institut AN ArmSSR (for Bayatyan).

L 30993-66   EWT(m)/T

ACC NR: AT6002498   SOURCE CODE: UR/3138/65/000/350/001/0012

AUTHOR: Alikhanov, A. I.; Bayatyan, G. L.; Brakhman, E. V.; Eliseev, G. P.; Galaktionov, Yu. V.; Landsberg, L. G.; Lyubimov, V. A.; Sidorov, L. V.; Zeldovich, O. Ya.; Yetch, F. A.

ORG: none

TITLE: π⁻ - meson-neutron elastic backward scattering at 1.4-4.0 bev/c

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 350, 1965. Pi sup minus-meson-neutron elastic backward scattering at 1.4-4.0 Bev/c, 1-12

TOPIC TAGS: pion scattering, neutron scattering, elastic scattering, scattering cross section, angular distribution, spark chamber

ABSTRACT: The authors study the elastic backward scattering reaction

$$\pi^- + n \rightarrow \pi^- + n$$

in the 1.38-4.05 bev/c range. A spark chamber was used with photographic and neutron counter registration. The experimental installation was highly efficient in

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L 30993-66
ACC NR: AT6002498

recording γ-quantum from π^0-decays, and the admixture of inelastic events

$$\pi^- + n \rightarrow \pi^- + n + K\pi^{0+-}$$

in the 1700 cases of the elastic backward scattering reactions which were selected for study was no more than 2%. The solid angles for these cases were measured and the absolute cross sections were determined. Tables are given showing the cross section $\bar{\sigma}_n = \bar{\sigma}_{D^2O} - \bar{\sigma}_{H_2O}$ and $R = \bar{\sigma}_{H_2O}/\bar{\sigma}_{D_2O}$ as functions of energy. The total error

in calculation of these cross sections due to necessary corrections for pion-pion and pion-neutron scattering in the ambient medium, electronic efficiency, beam composition and the shielding effect of nucleons in the deuterium was 25%. Data for σ_n and $<\sigma_n>$ as functions of energy show some irregularity in the 2-3 bev region which may be due to resonance. Measurements of angular distribution for pion-neutron scattering show a minimum in the 162-180° region. The momentum transfer function is used as a basis for calculating the width of this minimum. A comparison of the experimental data obtained in this paper with those in the literature shows that the cross section $d\sigma/d\Omega$ is approximately inversely proportional to energy when the momentum transfer is constant. Orig. art. has: 4 figures, 2 tables.

SUB CODE: 20/   SUBM DATE: 00/   ORIG REF: 000/   OTH REF: 009

Card 2/2 /c

5
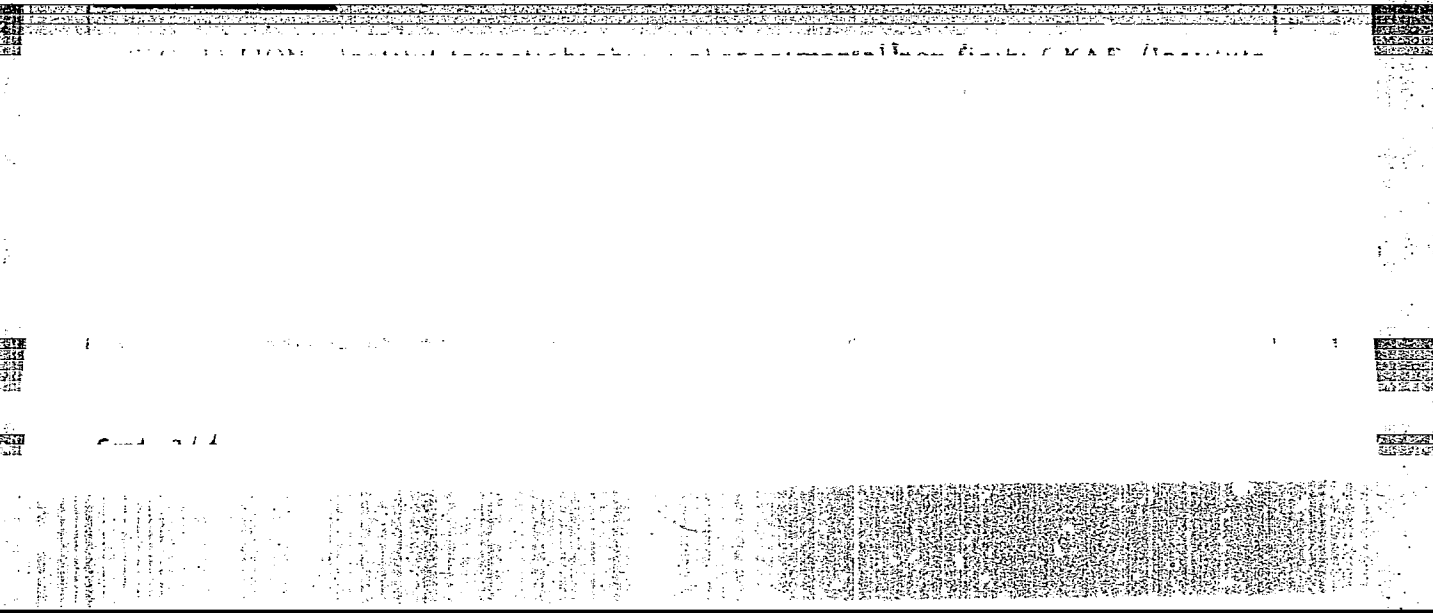
L 65207-65   EWT(m)/T/EWA(m)-2

ACCESSION NR: AP5021735   UR/0386/65/002/002/0090/0094

AUTHOR: Alikhanov, A. I.; Bayatyan, G. L.; Brakhman, E. V.; Galaktionov, Yu. V.;
Yeliseyev, G. P.; Yech, F. A.; Zel'dovich, O. Ya.; Landsberg, L. G.; Lyubimov, V.
A.; Sidorov, I. V.

49

TITLE: Elastic backward scattering of π-mesons by neutrons in the 1.4-4.0 Bev/s
pulse range

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu.
Prilozheniye, v. 2, no. 2, 1965, 90-94

TOPIC TAGS: pi meson, particle scatter, neutron scattering

ABSTRACT: The elastic backward scattering reaction $\pi^-+n \to \pi^-+n$ is studied in the
1.38-4.05 Bev/s pulse range. 1700 events of this reaction were selected with a pion
scattering angle of >90°. The solid angles for these events were measured (accuracy
of measurement in the horizontal plane was 1° and in the vertical plane--5°). The
results are given in graphic and tabular form. Orig. art. has: 3 figures, 1 table.

ASSOCIATION: none

Card 1/2

L 65207-65

ACCESSION NR: AP5021735

SUBMITTED: 02Jun65   ENCL: 00   SUB CODE: MP

NO REF SOV: 000   OTHER: 000

O

Card 2/2

L 45992-66   EWT(l)/EWT(m)/T   IJP(c)   WW

ACC NR: AP6030128   SOURCE CODE: UR/0120/66/000/004/0056/0059

AUTHOR: Bayatyan, G. L.; Galaktionov, Yu. V.; Zel'dovich, O. Ya.; Landsberg, L. G.

ORG: [Bayatyan] Institute of Physics GKAE, Yerevan (Institut fiziki GKAE);
Institute of Theoretical and Experimental Physics GKAE, Moscow (Institut
teoreticheskoy i eksperimental'noy fiziki GKAE)

$\frac{36}{32}$

B

TITLE: Large scintillation counters and counters intended for operation in magnetic
fields

SOURCE: Pribory i tekhnika eksperimenta, no. 4, 1966, 56-59

TOPIC TAGS: scintillation counter, particle counter

ABSTRACT: The results are reported of testing (a) large (up to 700 x 350 x 15 mm)
scintillation counters with one photomultiplier, and (b) long-lightguide counters
capable of operating in strong magnetic fields. The large counters with 190--250-mm
lightpipes were illuminated by a gamma beam from Cs^{137}; the irregularity of light
collection was found to be 40% or less. The effect of the scintillation-crystal
shape on the efficiency of particle recording was also explored. In the second type
of counters, the ambient magnetic field was eliminated by either a compensating
magnetic field derived from a special solenoid or by using lightguides long enough
(1500--1800 mm) for locating the photomultiplier in a (50--100-oe) region permitting

Card 1/2   UDC: 539.1.074.3

L-45992-66

ACC NR: AP6030128

application of magnetostatic shields. In one case of magnetic compensation, the counter operated with an efficiency of 0.997. "In conclusion, the authors wish to thank V. A. Lyubimov for useful discussions and graduate students Yu. V. Devyatykh, Ye. A. Strel'nikov, and V. D. Tarasov for their part in measurements." Orig. art. has: 4 figures, 1 formula, and 2 tables. [03]

SUB CODE: /8/ SUBM DATE: 12Aug65 / ORIG REF: 004 / ATD PRESS: 5087

Card 2/2 pb

ACC NR: AT6001620   SOURCE CODE: UR/3138/65/000/373/0001/0016

AUTHOR: Bayatyan, G. L.; Galaktionov, Yu. V.; Zol'dovich, O. Ya.; Landsberg, L. G.

ORG: [Bayatyan] Institute of Physics GKIAE, Yerevan (Institut fiziki GKIAE, Yerevan)

TITLE: Large scintillation counters and counters for operation in magnetic fields

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 373, 1965. Bol'shiye stsintillyatsionnyye schetchiki i schetchiki dlya raboty v magnitnykh polyakh, 1-16

TOPIC TAGS: scintillation counter, photomultiplier, STRONG magnetic field, light wave

ABSTRACT: Large scintillating counters and long light guides are essential for work in the area of strong magnetic fields. The authors have tested a variety of such counters in their experiments. The counters differed in shape and size of the crystals and length of light guides. In the case of each counter the authors de-termined the dependence of its effectiveness on the voltage of the photomultiplier and, in some cases, on the area of passage of particles through the scintillator. Measurements were conducted by studying cosmic rays   and   a beam generated by the ITEF accelerator under high load conditions. The signals from the counters entered the high-speed coincidence circuits. The resolution period of the circuits

Card 1/2

ACC NR: AT6001620

was 10-15 n sec. From the outputs of these circuits the standard signals proceeded to a slow coincidence circuit, which had a resolution of 10^{-7} sec. and an effectiveness of 100%. The experiments were conducted with large dimension counters, counters operating in strong magnetic fields, and counters with magnetic field compensation. Measurements of the amplitude spectrum of signals from the multipliers, taken with the magnetic field turned on and off, have shown that the activation of the magnetic field results only in an insignificant shift of the spectrum toward lower amplitudes (by 15-20%). The authors thank V. A. Lyubimova for her useful evaluations and Yu. V. Devyatikh, E. A. Strel'nikov, and V. D. Tarasova for their participation in the measurements. Orig. art. has: 1 formula, 2 tables, and 7 figures.

SUB CODE: 18 / SUBM DATE: 26Jul65/ ORIG REF: 003/ OTH REF: 000

Card 2/2

2

Evaluation of suitability of solvents for cellulose ester lacs. S. S. Mindlin and P. Ya. Zel'dovich. * Org. Chem. Ind.* (U. S. S. R.) 6, 21-5(1939).—A thermometer bulb is coated with a film of soln. of cellulose ester and the thermometer placed in an air thermostat at 20° and read at intervals until the initial temp. of 20° is again achieved. Milky films are observed when the fall in temp. is rapid, and are due to excess of volatile constituents of the solvent mixt. The suitability of solvent mixts. may be evaluated from the time-temp. curves obtained as above.

B. C. P. A.

Methods for removing iron from water. S. S. Mindlin and P. Va. Zel'dovich. *J. Chem. Ind.* (U. S. S. R.) 13, 1437 (1936).—Fe is pptd. along with Al(OH)$_3$ at p_H 6.0–6.4. The nature of the alkali used has no effect. Below p_H 6.4 the concn. of Al(OH)$_3$ has no effect, but from 6.4–7.0 its increased concn. increases the rate of pptn. of Fe.   H. M. Leicester.

ASM–SLA METALLURGICAL LITERATURE CLASSIFICATION

Nitrocellulose for light-stable celluloid. S. S. Mindlin, P. Ya. Zel'dovich, M. Ya. Kaplan, L. I. Kuz'mina and V. S. Remennikova. *Plasticheskie Massui* 1934, No. 4, 4-15.—The stability toward light of nitrocellulose films depends on impurities introduced during prepn. The most harmful impurities are ferrous salts; less harmful are ferric salts. Cu is also harmful. Extn. of the nitrocellulose with HCl can remove most of the Fe salts. Decompn. products of cellulose, org. acids, aldehydes and NaOCl, used for bleaching, have no effect. The photostability is independent of the temp. of nitration and the thermal stability. If the H₂O used in the process is free from metallic salts, and noncorroding app. is used, photostable nitrocellulose will be obtained.   H. M. L.

ZEL'DOVICH, Rafail Nekhem'yevich; MINTS, D.M., red.; SALAZKOV, N.P.,
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[Manual on technical and economic estimations in selecting
water-treating methods] Posobie po tekhniko-ekonomicheskim
raschetam pri vybore metodov ochistki vody. Moskva, Izd-vo
M-va kommun.khoz.RSFSR, 1963. 85 p.   (MIRA 16:10)
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SHIFRIN, Semen Markovich, doktor tekhn. nauk, prof.; ZEL'DOVICH, Rafail Nekhem'yevich, , kand. ekonom. nauk, dots.; DANILOV, Petr Mikhaylovich, ekonom.; REZNIK, A.I., red.; UCHITEL', I.Z., red. izd-va; LELYUKHIN, A.A., tekhn. red.

[The economics of water supply and sewerage management and construction]Ekonomika vodoprovodno-kanalizatsionnogo khoziaistva i stroitel'stva. Pod obshchei red. S.M.Shifrina. Moskva, Izd-vo M-va kommun.khoz.RSFSR, 1962. 357 p.
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Determining the optimum number of filters. Vod.i san.tekh.
no.8:6-9 Ag '57   (Filters and filtration)   (MIRA 10:11)

GOL'DSHTEYN, Ya.Ye., kand.tekhn.nauk; ZEL'DOVICH, V.I., inzh.; KEYS, N.V.,
     inzh.; KOSSOVSKIY, L.D., inzh.; VAYNSHTEYN, O.Ya., inzh.;
SHMATKO, K.S., inzh.

Effect of treating liquid chromium-nickel steel by cerium on
the characteristics of its crystallization. Stal' 22 no.3:256-
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1. Chelyabinskiy nauchno-issledovatel'skiy institut motallurgii
i Chelyabinskiy metallurgicheskiy zavod.
     (Chromium-nickel steel--Metallography) (Cerium)

GOL'DSHTEYN, Ya.Ye., kand.tekhn.nauk; ZEL'DOVICH, V.I., inzh.; KOMISSAROV, A.I., inzh.; KOROTKEVICH, Ye.L., inzh.

Effect of rare-earth metals on the properties of chromium-nickel steel.
Stal' 23 no.4:354-358 Ap '63.   (MIRA 16:4)

1. Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii i
Chelyabinskiy metallurgicheskiy zavod.
   (Chromium-nickel steel—Metallurgy)   (Rare earth metals)

ACC NR: AP7002739   (N)   SOURCE CODE: UR/0126/66/022/006/0890/0895

AUTHOR: Zel'dovich, V. I.; Sadovskiy, V. D.; Sorokin, I. P.

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TITLE: Dilatometric anomalies in textured alloys during $\alpha \rightarrow \gamma$ transformation

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 6, 1966, 890-895

TOPIC TAGS: dilatometric anomaly, ferronickel alloy, ferromanganese alloy, austenite transformation, martensitic transformation / N12 ferronickel alloy, N15 ferronickel alloy, N23 ferronickel alloy, N28 ferronickel alloy, N32 ferronickel alloy, N27T2 Fe-Ni-Ti alloy, G7 ferromanganese alloy, G14 ferromanganese alloy

ABSTRACT: In textured Fe-Ni alloy the change in volume during $\alpha \rightarrow \gamma$ transformation of the martensitic type occurs nonisotropically. In particular, the transformation is accompanied by elongation of the alloy in the direction of the axis of texture although the specific volume of the γ-phase is smaller than that of the α-phase. In a statistically isotropic alloy the extent of the dilatometric (linear) effect during transformation reaches one-third of the volume effect; the same ratio exists between the linear and volume effects of transformation in an anisotropic material if the phase transition occurs in a crystallographically disordered manner. Any

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