



L 9581-66 EWP(b)/EWP(t) IJP(c) JD

SOURCE CODE: PO/0053/65/000/010/0473/0476

ACC NR: AP5026670

AUTHOR: Janik, E.

39  
B

ORG: Department of Electronics, IPPT PAN (Zakad elektroniki IPPT PAN)

TITLE: Germanium-silicon heterojunctions as high-speed switching diodes

SOURCE: Przegląd elektroniki, no. 10, 1965, 473-476

TOPIC TAGS: semiconductor diode, germanium semiconductor, silicon semiconductor, electronic switch

ABSTRACT: Three versions of a high-speed switching diode employing Ge-Si heterojunctions are described. Switching time for all three is independent of minority carrier lifetime and base thickness (150 μ). The diodes differ only by specific resistance of the Si base (D1, 12 ohm-cm; D2, 1.2 ohm-cm; D3, 0.12 ohm-cm). Parameters of the diodes for a bias voltage of -4 v are given in the accompanying table. Orig. art.

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UDC: 621.389

L 9381-66

ACC NR: AP5026670

Table 1. Switching Diode Parameters

Parameter	D1	D2	D3
Switching time, nanosec	2.5	5	0.12
Q	70	95-110	250-300
Voltage drop at a current of 10 mamp, v	2.5	0.9	0.5
Maximum current, mamp	18	30	40
Average inverse current at a bias of -6 v, $\mu$ mamp	0.2-1.5	0.8-3	5-20
Forward voltage, v	~40	~15	~5

0

has: 6 figures, 2 formulas, and 1 table.

[PW]

SUB CODE: 09/ SUBM DATE: 04Jun65/ ORIG REF: 002/ ATD PRESS: 4153

Card 212 1/2

JANIK, F.

Polish Technical Abstracts  
No. 4, 1953  
Transport

2494

Janik F. Development of Strength Requirements for Aircraft Structures.

„Rozwój przepisów budowy samolotów”. Technika Lotnicza. No. 5, 1952, pp. 126—135, 10 figs.

The author reviews the history of Polish strength standards for aircraft structures. He discusses the principal cases of loading and the origin of flight envelopes, emphasizing Poland's contribution to the establishment of modern strength standards. He compares Polish strength standards with those of other countries and with international standards, and includes a short history of the development of the last named.

① Struct

620.177:629.135.2

JANK, F.

Velocity and speed in aeronautics. p. 15.

SKRZEDLATA POLSKA. (Liga Lotnicza) Warszawa, Poland.  
Vol.11, no.30, July 1955.

Monthly list of East European Accessions (EEAI) LC, Vol.9, no.1, Jan. 1959.

Uncl.

JANIK, Fr., prof. inz.

Dynamic fundamentals of the movement of artificial satellites.  
Techn lotn 18 no.10:262-268 0 '63.

P/552/61/000/013/003/005  
D237/D308

AUTHOR: Janik, Franciszek, Professor of Engineering  
TITLE: The problem of the ratio of constant forces in a self-stabilizing aerodynamical balance  
SOURCE: Warsaw. Instytut Lotnictwa. Prace. no. 13, 1961, 23-28

TEXT: The author discusses the phenomenon of instability of a balance in a wind tunnel and describes a self-stabilizing balance of his own design. Normally, three independent balances,  $W_1$ ,  $W_2$  and  $W_3$  are used to measure the lift, the longitudinal momentum and drag respectively, and the first one is found to be the least stable. Considerations of stability conditions led to the design of a coupled balance to replace  $W_1$  and  $W_2$ . The coupling of  $W_1$  and  $W_2$  is equivalent to the transposition of the instantaneous center of rotation of the profile to the position in front of the profile, with a resulting stabilizing effect. A description of the balance

Card 1/2

The problem of the ratio ...

P/532/61/000/013/003/005  
D237/D308

is followed by a discussion of the setting of the angle of attack and of the measurements of drag and momentum. Finally, the problem of the ratio of constant forces which arises from the method of coupling, is solved and illustrated by a numerical example and a nomogram. There are 8 figures and 1 table.

SUBMITTED: June, 1960

Card 2/2



P/532/62/000/016/001/003  
D237/D308

AUTHOR: Janik, Franciszek, Professor, Engineer

TITLE: Computation of laminar profiles by R. Eppler's method

SOURCE: Warsaw. Instytut Lotnictwa. Prace. no. 16, 1962, 3-19

TEXT: This work is a development of R. Eppler's second method (Ing. Arch., 1957, 32), based on Lighthill's complex potential derivative. After a short discussion of pressure distribution methods of profile determination, the author uses Eppler's 2nd method and conformal transformation to compute a laminar profile, and derives the expressions for the function  $P(\varphi)$  describing the profile and its conjugate  $Q(\varphi)$ , its properties and the velocity distribution on the profile.  $Q(\varphi)$  is defined by a Poisson integral, which has to be computed numerically. An error due to a discontinuity in  $P(\varphi)$  is discussed, and a correcting procedure given. A numerical example is solved to illustrate the method. There are

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Computation of Laminar ...

P/532/42/000/016/001/003  
D237/D308

18 figures.

SUBMITTED: November , 1961

Card 2/2

JANIK, Franciszek (Warsawa)

Multiple relative motion. Archiw bud mass 11 no.2:381-388 '64

JANIK, Franciszek (Warsaw)

Motion of the material point over a rough conical surface rotating around its axis. Archiw bud maszyn 12 no.1:85-105 '65.

1. Submitted September 1964.

JANIK, I.

COUNTRY : Poland

E-21

ABST. JOUR. : Zeszita., No. 5 1960, No.

19519

AUTHOR : Janik, I. and Kowol, H.

NOTE : Not given

TITLE : Experiments on the Application of Producer Gas and Natural Gas Resins in the Production of Coke Briquettes

ORIG. PUB. : Koka, Smola, Gav, 3, No 2, 60-62 (1958)

ABSTRACT : The feasibility of the application of binders obtained from producer gas and natural gas resins in the production of metallurgical coke by the process developed at the Institute for the Chemical Processing of Coal is demonstrated. In this process the briquettes (B) are subjected to oxidative heat treatment. The effect of binder formulation, heat treatment time, and heat treatment temperature on the mechanical properties of B has been investigated. The selection of optimum heat treatment

CARD: 1/2

310

L 34161-66 EWP(t)/ETI IJP(c) JD

ACC NR: AP6026033

SOURCE CODE: CZ/0034/66/000/003/0153/0159

AUTHOR: Janik, Ivo (Engineer)

28

ORG: Klement Gottwald Vitkovice Iron Works, Ostrava (Vitkovicke zelezarny KG)

B

TITLE: Effect of the slag basicity and silicon content in ferromanganese on parameters of blast furnace operation

27

SOURCE: Hutnicke listy, no. 3, 1966, 153-159

TOPIC TAGS: slag, silicon, ferromanganese, blast furnace, coke, industrial production, metallurgic industry

ABSTRACT: Both the technical and the economic parameters are affected by the basicity of the ferromanganese slag, and by the content of Si in ferromanganese. Minimum coke consumption is achieved at a basicity of 1.04% and for a Si content in ferromanganese of 1.5%. Maximum Mn recovery is obtained with a slag basicity of 1.60%, and a Si content of 1.94%. Maximum production rate is obtained with a basicity of the slag being 1.36%, and the Si content 1.73. Lowest production costs are obtained with a slag basicity of 1.40%, and a Si content of 1.76%. When the Si content in ferromanganese drops below a limit, the slag basicity should be reduced to obtain maximum economy of the process. Orig. art. has: 7 figures, 11 formulas and 3 tables. [Based on author's Eng. abst.] [JPRS: 36,646]

SUB CODE: 11, 13, 05, 21 / SUEM DATE: none

Card 1/1 JJ

UDC: 669.168.2

0916 1059

JANIK, J.

Mottl, J. Removal of waste viscose in the production of fibers.  
p. 249.  
VODA, Prague, Vol. 34, no. 8, Aug. 1954.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 6,  
June 1956, Uncl.

JANIK, J.; TOBĀK, F.

Purification of waste water from oil processing and soap factories. p. 113.

Vol. 35, no. 4, Apr. 1956

VCDA

Praha, Czechoslovakia

Source: East European Accession List. Library of Congress  
Vol. 5, No. 3, August 1956



JANIK, J.

Wheel-rolling resistance with rubber tire or iron rim. p.285. JARMUVEK  
MEZOGAZDASAGI GEPEK. Budapest. Vol. 3, No. 9, Sept. 1956.

SOURCE: East European Accessions List (EEAL), Library of Congress  
Vol. 5, No. 12, December 1956

JANIK, Jerzy  
SURNAME, Given Names

Country: Poland

Academic Degrees: not given

Affiliation: not given

Source: Warsaw, Przegląd Lekarski, No 6, 1961, pp 241-244.

Data: "Rymanow Mud and Its Application in Spa Treatment for Children."

GPO 981643

89524

Z/003/60/000/026/004/004  
A201/A026

Small Vertical Take-Off and Landing Transport Aircraft

propeller blades. The flow of the exit gases into the nozzles and / or a special turbine would be directed by a hydromechanically controlled vane. The propellers would be coupled by shafting and powered by the main engine. The upper (suction) side of the propeller bays would be provided with hydraulically controlled cover plates, the lower side of the bays would be covered with a shutter system. During hovering or vertical flight this version would be controlled either by air jet in nose, tail and wings, or by special vanes positioned in the slipstream beneath the shroud, or by small ducted fans fitted into the wings and the tail and driven by compressed air. Conventional controls would be used during forward flight. The second version, shown in Figure 5, belongs to the tiltable ducted-propeller VTOL aircraft category. It would be powered by two turboprop engines of which the rear engine would be tiltable. Except for the rear ducted unit, this version would externally not differ from the jet-powered version. The turboprop engines would be furnished with clutches and coupled by shafting. The fore propeller would be driven through a transmission and be clutch-controlled. During forward flight, the fore propeller would be disconnected and completely covered. During hovering or vertical flight, this version would be controlled either by air-jets or by small ducted-fan units fitted into the wings and the tail. There are 3 photographs and 6 figures.

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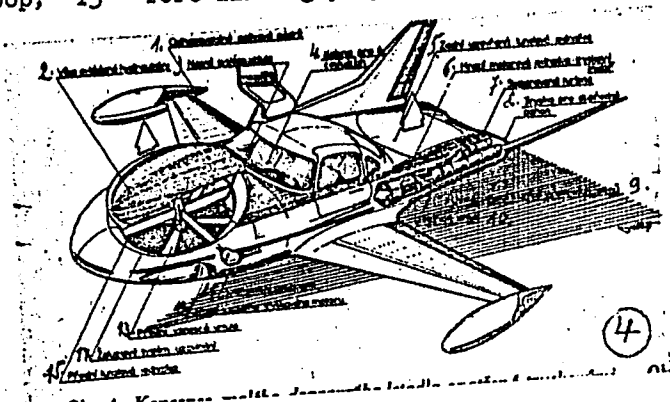
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A201/A026

Small Vertical Take-Off and Landing Transport Aircraft

Figure 4: Conceptual design of a small transport aircraft powered by jet engines  
1 - drop fuel tanks; 2 - hydraulically controlled cover plate; 3 - propeller  
mounting; 4 - cabin for 6 passengers; 5 - rear ducted unit in closed position;  
6 - jet engine; 7 - separate turbine; 8 - jet exhaust for forward flight; 9 -  
exit-gas directing vane; 10 - propeller drive; 11 - shaft joint; 12 - jet-en-  
gine air scoop; 13 - fore lifting propeller; 14 - shutter system; 15 - fore  
ducted unit



Card 3/4

JANIK, Jiri, inz.

Shall we have service airplanes for official business use? Letecky  
obzor 5 no.1:2-5 '61.

JANIK, J.

Distr: hE2a(c) 19

Scattering of slow neutrons by ammonia molecules.  
J. A. Janik, J. Janik, and A. Wanic (Inst. Badań Jądrowych, Warsaw). *Polish Acad. Sci., Inst. Nuclear Research Rept. No. 117/OFJ*, 5 pp. (1959) (in English).—The scattering cross section of the NH<sub>3</sub> mol. per 1 proton was detd. as a function of neutron energy from 0.018 to 0.15 e.v. at 283–313°K. with hematite (at 0.018–0.03 e.v.) and Cu (at 0.03–0.15 e.v.) crystals as neutron monochromators. The results agree well with the Krieger-Nelkin theory (CA 51, 174196) for gases and, when mol. rotation is assumed to be obstructed, with Wanic's development of the theory (cf. preceding abstr.) for liquid NH<sub>3</sub>. A. Szufrański

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1

29568

P/046/60/005/007/007/007  
D238/D304

26.22.12

**AUTHORS:** Janik, Jerzy A., Janik, Janina, Kraśnicki, Szczesny, Maniawski, Franciszek, Murasik, Andrzej, Rżany, Henryk, Szkatuła, Antoni, Ściesiński, Jan, and Wanic, Adam

**TITLE:** On the scattering of thermal neutrons in molecules containing hydrogen

**PERIODICAL:** Nukleonika, v. 5, no. 7-8, 1960, 495 - 499

**TEXT:** Investigations carried out in this field can be divided into the following areas: 1) Verification of the neutron scattering theory by molecules of molecular gases. 2) Examination of the structure of liquids by determining how far the active cross sections obtained experimentally differ from neutron scattering derived from theory. 3) Neutron scattering on polarized molecules. 4) Neutron scattering by molecules which show an oscillation level in the region of thermal energy. After mentioning the T.I. Krieger- M.S.

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On the scattering of ...

Nelin formula for the active cross section of neutron scattering in an atom of a molecule as a function of the sample temperature, the geometric molecular structure and the neutron energy, the authors indicate the exhaustive calculations of Krieger and Nelkin -- to prove their theory -- for the molecules  $\text{CH}_4$  and  $\text{H}_2$  and which established their agreement with E. Melkonian's experimentally obtained data in the field of energy. Similar calculations have been carried out in the Cracow Center for the molecule  $\text{C}_2\text{H}_4$ , and the results compared with measurements made by Melkonian; as a result, an identical agreement has been established between experiments and theory (Ref. 3: J.A. Janik, F. Maniawski, and H. Rżany: Acta Phys. Polon. 17, 489, 1958). In addition measurements have been made in the EWA-reactor with gas molecules of  $\text{NH}_3$  (Fig. 2); in these an aluminum crystal was employed as neutron monochromator. Results obtained in this way conform fully with the Krieger-Nelkin theory (Ref. 4: J.A. Janik, J. Janik, and A. Wanic: Physica 26, 449, 1960).

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On the scattering of ...

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Fig. 2. Active cross-section of neutron scattering of  $\text{NH}_3$  molecules as a function of neutron energy.  $\circ$  - experiments for gaseous  $\text{NH}_3$ ;  $\bullet$  - experiments for liquid  $\text{NH}_3$ . Curve calculated on the basis of the Krieger - Nelin theory for gaseous  $\text{NH}_3$ .

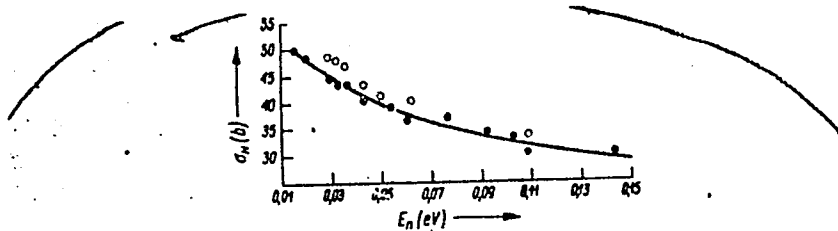


Abb. 2. Wirkungsquerschnitt auf die Neutronenstreuung der  $\text{NH}_3$ -Molekülen als Funktion der Energie der Neutronen.  $\circ$  - Experimente für den gasförmigen  $\text{NH}_3$ ;  $\bullet$  - Experimente für den flüssigen  $\text{NH}_3$ . Kurve berechnet auf Grund der Theorie von Krieger und Nelkin für den gasförmigen  $\text{NH}_3$ .

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On the scattering of ...

The results obtained by Melkonian on neutron scattering by water in a liquid state were compared with the Krieger-Nelkin theory for gaseous H<sub>2</sub>O. Measurements of neutron scattering in NH<sub>3</sub> and H<sub>2</sub>S were also carried out with the use of crystal monochromators (Ref. 5: A. Wanic: Acta Phys. Polon. 18, 255, 1959). The results obtained show a systematic increase of the active cross section as one passes from gases to liquids. These experimental facts can also be interpreted as answering the question, to what extent free molecular rotation is impossible in the fluid state. In the case of liquid water and ammonia, this determination is in agreement with the well known fact that the association in these liquids through hydrogen bonding is strengthened. In liquid hydrogen sulphide, for which there are inadequate physico-chemical data on hydrogen bonding evidence, the impossibility of free rotation is caused perhaps by a strong molecular packing. At the Cracow Center for Nuclear Physics, measurements have been made of the influence of molecular polarization, in which an easily polarizable liquid (in a crystal-fluid

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On the scattering of ...

Fig. 4.

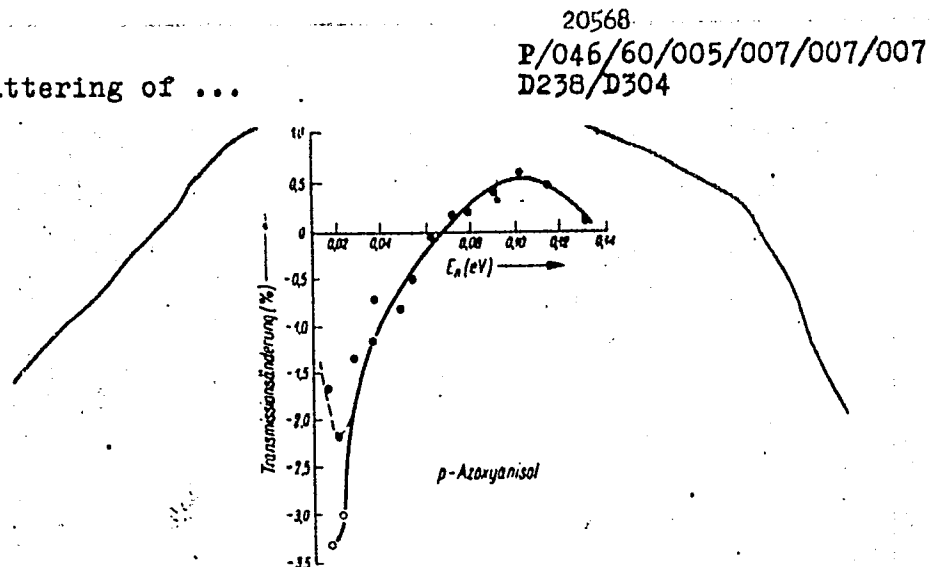


Abb 4. Transmissionsänderung der Neutronen als Funktion der Energie der Neutronen für den kristallflüssigen *p*-Azoxyanisol bei dem Übergang vom polarisierten zu unpolarisierten Zustand

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● — Experimentale Ergebnisse; ○ — nach der Korrektur für die Streuung der zweiten Ordnung

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D238/D304

Fig. 4. (cont'd) Alteration of transmission of neutrons as a function of energy of the neutrons for liquid crystal para-azoxyanisol when passing from polarized to unpolarized state. ● - experimental results; ○ - after correction for scattering of the second order.

state), namely so-called P-Azoxyanizol has been used in the magnetic field. (Ref. 6: J. Janik, S. Kraśnicki, and A. Murasik: Acta Phys. Polon. 17, 483, 1958). The results of initial measurements have already been published (Ref. 6: Op.cit.) and further measurements are in progress. The main results are presented in Fig. 4. Experimental points and the curves drawn through them represent the percentage alteration in test transmission due to polarization of its molecules by a magnetic field, in relation to the decrease of polarization. This change is, as can be seen, a function of the energy of neutrons and indeed causes the neutron polarization of the sample; in the case of low energies a lowering and in the case of high energies a rise of neutron transmission occurs. This rela-

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On the scattering of ...

tionship can be explained to a semiquantitative degree on the basis of the Krieger-Nelkin theory; it is necessary to assume here that the  $\text{CH}_3$  groups at the end of the p-azoxyanisol molecule carry out a restricted rotational movement about the co-axis, while on the other hand the whole molecule carries out free rotation about the longitudinal axis. Where molecules have an oscillatory level in the energy region, one should expect a local maximum of the relationship between active cross sections and neutron scattering of the energy of these neutrons. This maximum should appear for the particular neutron energy which is necessary to create this oscillation level. Measurements have been made for liquid  $\text{CH}_3\text{SH}$  and, in fact, a local maximum of active cross section has been obtained where the level of oscillation of the internal restricted rotation was located. Measurements for gaseous  $\text{CH}_3\text{SH}$  are in progress; it can be already stated that in gaseous methylmercaptan there are two further local maxima in the vicinity of restricted rotation which could be shown as proof of the existence of levels of restricted rotation.

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This research was carried out in the EWA-reactor in Świerk with the aid of a slow chopper built by the Cracow Center for Nuclear Physics. There are 4 figures and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc. [Abstractor's note: This article is written in German].

ASSOCIATION: Polnische Akademie der Wissenschaften, Institut für Kernforschung, Warszawa;  
Neutronenlaboratorium des Krakauer Zentrums für Kernphysik (Polish Academy of Sciences, Warsaw Institute of Nuclear Research;  
Neutron Laboratory of the Cracow Center for Nuclear Physics)

SUBMITTED: May 9, 1960

Card 8/8

4

P/045/61/020/008/003/004  
B109/B202

AUTHORS: Janik, Janina, and Janik, Jerzy A.

TITLE: Determination of the density of liquids and their saturated vapors as a function of temperature at pressures above one atmosphere. Part I. Measurements with ammonia

PERIODICAL: Acta Physica Polonica, v. 20, no. 8, 1961, 679-690

TEXT: K. Bennewitz and J. J. Windisch, (Z. phys. Chem., 166, 401 (1933)) described a method for measuring the density of liquids. A small magnet is dipped into the liquid where it is kept floating by means of an electromagnetic coil fastened outside. This method has been improved and the density of ammonia can now be determined with a mean error of only  $\pm 7 \cdot 10^{-4} \text{ g/cm}^3$ . This high accuracy is necessary for studying neutron scattering in liquids and gases. The apparatus is shown in Fig. 1: A - brass vessel, S - coil with 1190 windings, length 57 mm, inner diameter 15 mm, outer diameter 36 mm, R<sub>1</sub> - experimental tube produced from "Rasotherm" glass, inner diameter 3.87 mm, wall thickness approximately

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Determination of the density of...

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3 mm, B - heat insulation, P - float 5 mm long, 2 mm diameter,  $W_1$  and  $W_2$  are observation windows for determining the moment at which the float rises from the bottom,  $R_2$  experimental tube for measuring the density of the saturated vapor,  $W_3$  observation window. The amperage in the coil at which the float rises from the bottom is measured by an ammeter of accuracy index 0.5. Liquids of known density were used for the calibration of this apparatus; an exact linear dependence was found to exist between the square of the current density in the coil and the density of the liquid investigated. Synthetic ammonia was used to measure the temperature dependence of the density of ammonia produced by the factory "Azoty" in Kędzierzyn which had been distilled prior to being filled into the experimental tube. When measuring the density of the saturated vapor the spheroidal shape of the lower part of the tube as well as the shape of the meniscus of the free surface of the liquid have to be taken into account. If  $m_c$  is the mass of the liquid,  $m_g$  the mass of the vapor,  $m = m_c + m_g$ ,  $v$  the volume of the tube,  $v_c$  the volume of the liquid phase in the tube,  $d_t^c$  the density of the liquid phase of the substance, then

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Determination of the density of...

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$$d_t^g = \frac{m - d_t^c \cdot v_c}{v - v_c} \quad (2)$$

holds for the density of the saturated vapor. Good measurement accuracy is achieved if the liquid in the experimental tube is much lower than the vapor height. The liquid height was measured through the window with a cathetometer from the point A to the points D and C (Fig. 6). The meniscus volume was calculated assuming an ellipsoidal shape of the meniscus with the semiaxis equal to the inner radius of the tube and to the distance CD. After opening the tube, removing the ammonia and filling both pieces of the tube with mercury and after weighing this mercury, the volume of the experimental tube was measured. The height of the mercury meniscus was exactly measured by means of a cathetometer. The authors thank the Director of the Laboratory of Physical Chemistry of the Jagellonian University, Professor B. Kamiński, for his interest, Professor H. Niewodniczański for enabling them to carry out part of the work in the Institute of Nuclear Physics in Cracow, Engineer S. Fabiani for many remarks, S. Moroz for technical help and B. Konderak, J. Mozer and B. Siwek for assistance in the measurements. There are 8 figures,

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Determination of the density of...

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5 tables, and 12 references: 10 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Laboratory of Physical Chemistry and Electrochemistry,  
Jagellonian University, Cracow. Institute of Physics,  
Jagellonian University, Cracow

SUBMITTED: March 12, 1961

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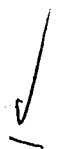
P/045/61/020/008/004/004  
B109/B202

AUTHORS: Janik, Janina, and Janik, Jerzy A.

TITLE: Determination of the density of liquids and their saturated vapors as a function of temperature at pressures above one atmosphere. Part II. Measurements with methyl mercaptan

PERIODICAL: Acta Physica Polonica, v. 20, no. 8, 1961, 691-699

TEXT: Using the method given by the authors (Ref. 1: Acta physica Polon., 20, 679 (1961)) and Bennewitz, K., Windisch, J. J. (Z. phys. Chem., 166, 401 (1933)) the density of liquid mercaptan and its saturated vapor as a function of the temperature was determined in the range 20-80°C since its exact knowledge is necessary for the study of neutron scattering. Water, aqueous solution of phosphoric acid, aqueous solutions of ethyl ether, ethyl alcohol, methyl alcohol, and solutions of ethyl ether in methyl alcohol were used to calibrate the apparatus described in Ref. 1. Vaseline oil served as thermostatic liquid since at higher temperatures, the electric conductivity of water is too high. Vaseline oil was applied because of its relatively low viscosity causing a sufficiently fast



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Determination of the density of...

circulation and preventing temperature gradients in the measuring vessel.  $\text{CH}_3\text{SH}$  produced by the method of Arndt, F. (Berichte d. Chem. Ges., 54, 2236 (1921)) which had been twice distilled in the vacuum and then, again in the vacuum, was distilled into the experimental tube (cooling substance solid  $\text{CO}_2$ ) was used for the measurements. The results of measurements are given in Table III (mean error  $\pm 0.0002 \text{ g/cm}^3$ ). Good agreement is obtained with the values given by Berthoud, A., Brum, R., (Ref. 4: J. Chim. phys., 21, 153 (1924)) and those published in the Handbook of Chemistry and Physics 41 ed., (1959) p. 1097, 2305. The density of the saturated  $\text{CH}_3\text{SH}$  vapor was determined according to formula (2) in Ref. 1. The results of measurement are given in Table IV. These values are much better than the data given in Ref. 4 for the range between  $43.5^\circ\text{C}$  and  $92.7^\circ\text{C}$ . The authors assume that Berthoud and Brum determined the value for  $92.7^\circ\text{C}$  incorrectly. An additional argument which supports their assumption is the fact that when regarding the results of Berthoud and Brum in the vicinity of  $90^\circ\text{C}$  as correct one obtains an unsatisfactory result from experiments on the neutron scattering by  $\text{CH}_3\text{SH}$ . The deviation of points calculated on the

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Determination of the density of...

basis of data by Berthoud and Brum in the vicinity of the critical point is incomprehensible and perhaps due to experimental errors. For this reason it may be suspected that the value of  $0.3315 \text{ g/cm}^3$  given in Ref. 4 for the critical density was also incorrectly determined. Assuming that a straight-line dependence of  $(d_t^g + d_t^c)/2$  on temperature holds up to the critical point and plotting this line on the basis of data of the present study, one obtains a value of  $0.3225 \text{ g/cm}^3$  (assuming  $196.8^\circ\text{C}$  as the critical point) for the critical density of methyl mercaptan. The authors thank J. Korohoda for her help in the measurements and to S. Moroz for valuable technical help. There are 4 figures, 5 tables, and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Laboratory of Physical Chemistry and Electrochemistry,  
Jagellonian University, Cracow. Institute of Physics,  
Jagellonian University, Cracow.

SUBMITTED: March 12, 1961

Card. 3/5

Determination of the density of...

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TABLE III

Temperature	$i_p$ average [A]	$i_p^2$ average	The obtained density of liquid $\text{CH}_3\text{SH}$ [g/cm <sup>3</sup> ]
20°C	0.3263	0.10647	0.8677
25°C	0.3307	0.10936	0.8608
30°C	0.3336	0.11129	0.8560
40°C	0.3421	0.11703	0.8420
50°C	0.3508	0.12306	0.8272
60°C	0.3602	0.12974	0.8107
70°C	0.3694	0.13646	0.7945
75°C	0.3722	0.13853	0.7890
80°C	0.3773	0.14236	0.7797

Card 4/5

Determination of the density of...

P/045/61/020/008/004/004  
B109/B202

TABLE IV

Temperature	Average $d_T^d$ in g/cm <sup>3</sup>
20°C	0.00351 ± 0.00019
25°C	0.00371 ± 0.00028
30°C	0.00424 ± 0.00013
40°C	0.00522 ± 0.00023
50°C	0.00694 ± 0.00059
60°C	0.00934 ± 0.00038
70°C	0.01191 ± 0.00022
75°C	0.01240 ± 0.00027
80°C	0.01390 ± 0.00071

Card 5/5

TUBBS, N.; SAGAN, U.; RZANY, H.; JANIK, J.A.; JANIK, J.

The total scattering cross section of slow neutrons in gaseous  $H_2S$ . Inst fiz jadr report no.160:1-6 J1 '62.

1. Exeter College, Oxford (for Tubbs). 2. Instytut Fizyki Jadrowej Krakow (for all except Tubbs).



JANIK, Janina

Determination of the density of liquids and their saturated vapors  
as a function of temperature at pressures higher than 1 atm. Pt.3.  
Acta physica Pol 23 no.4:487-492 Ap '63.

1. Laboratory of Physical Chemistry and Electrochemistry,  
Jagellonian University, Krakow, ul. Krupnicza 41.

JANIK, Janina

A method for the determination of the density of liquids and their saturated vapors at pressures higher than atmosphere. Roczniki chemii 37 no. 7/8:849-862 '63.

1. Department of Physical Chemistry and Electrochemistry, Jagiellonian University, Krakow.

JANIK, Janina Maria

Rotational dynamics of the  $\text{NH}_4$  group in ammonium perchlorate and of the  $\text{H}_3\text{O}$  group in hydronium perchlorate. Inst fiz jadr report no.360:1-59 '64.

1. Institute of Physical Chemistry and Electrochemistry of the Jagiellonian Institute, Krakow, and Institute of Nuclear Physics, Krakow.

1. The A.S. ... of ... rotational barrier per ... carbohydrate scattering cross section.

cross sections as function of neutron wavelength

Card 1/2

3 figures.

ASSOCIATION: Instytut Chemii Fizycznej i Elektrochemii Uniwersytetu Jagiellońskiego,

L 19114-63

EWA(h)/EWT(m)/BDS AFFTC/ASD/AFWL

ACCESSION NR: AP3001734

P/0061/63/000/002/0125/0140

AUTHOR: Janik, Jozef (Diploma Major)

53

TITLE: Characteristics and comparison of effects of low and high yield nuclear weapons

19

SOURCE: Przegląd wojsk lądowych, no. 2, 1963, 125-140

TOPIC TAGS: shock wave, thermal radiation, nuclear radiation, atmospheric blast, skin burn, skin injury, crater depth, crater diameter, high yield nuclear weapon, low yield nuclear weapon

ABSTRACT: The article is a summation of data on damages caused by nuclear weapons explosions of small and high intensity. The total energy of an explosion consists of three parts: the shock wave accounting for 50 % of damage, thermal -- 35 %, and radiation of nuclear particles causing about 15 % terrain damage. The altitude and rate of descent of the radiation-producing cloud after a 1 megaton nuclear explosion on the surface of the earth are shown in table 1

Card 1/13

L 19144-63

ACCESSION NR: AP3001734

for altitudes of 3.2 to 22.5 km at an average velocity of 480 to 56 km/hr, the latter figure having been reached in 6.3 min. Damage caused by the shock wave are shown in tables 2 to 5. The type of damaged buildings, airplanes, cars and people, the degrees of damages and the areas damaged after 20 kiloton to 20 megaton explosions in air are given. A 20 megaton explosion can cause a total destruction within a 200 sq km area. Thermal radiation of a nuclear explosion and its parameters are shown in tabular and graphical form for explosions on earth's surface and in the air. 10 kiloton to 20 megaton explosions can produce thermal radiations of 3 to 12 cal/sq cm at a distance of up to 80 km as shown in Fig. 2 of Enclosure 1.; and the 1st, 2nd and 3rd -- degree burns caused by such explosions are given in a table and on Fig. 4 of Enclosure 2. It is shown in tables 8 and 9 that overhead nuclear explosions cause about twice as bad burns as explosions of identical force on ground level. Magnitude and characteristics of nuclear radiation contamination of the terrain from 20 kiloton to 1 megaton explosions on earth's surface are given in Tables 10 to 12 and shown of Fig. 5 of Enclosure 3. It is shown that from a 1 megaton explosion, the nuclear radiation contamination is as high at 10 rtg/hr, even at an altitude of 500 km. Size and type of craters resulting from atomic explosions at the surface of the earth are also discussed and their depth and diameter are shown in Fig. 7

Card 2/13



L 19114-63

ACCESSION NR: AP3001734

of Enclosure 4 as function of the intensity of explosion. Orig. art. has:  
3 formulas, 7 figures and 14 tables.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 06Jun63

ENCL: 04

SUB CODE: NS, AR

NO REF SOV: 000

OTHER: 000

Card 3/33

3A

CA JANIK, J.A.

Selective absorption of thermal neutrons in selenium and arsenic. J. A. Janik (Lagellonian Univ., Krakow, Poland). *Acta Phys. Polon.* (B), 261 (1958). Neutrons from a Ra-Be source, slowed down to thermal energies in paraffin, were allowed to pass through powder, pure Se or As in an Al box into an ionization chamber lined with B and enclosed in a Cd box. Layers of B of 3 different thicknesses were placed between the source and the absorber in order to select particular neutron energies. Cross sections for thermal neutrons of As and Se nuclei were calculated, and found not to be proportional to  $1/v$ . This was assumed to be due to elastic scattering in the microcryst. structure of Se and As. H. Newcombe.

JANK, J. A.

... related experimental ... With increasing  
concentrations of acid, effects attributable to the limited rotational  
freedom of water of hydration appear. The theory of ...

P O L .

539.485  
2766. Influence of the electrolytic dissociation and the hydration of  $H_2SO_4$  molecules on the scattering of slow neutrons. J. A. JANIK, *Acta phys. Polon.*, 11, No. 2, 146-54 (1952).

Coefficients of absorption of slow neutrons in  $H_2SO_4$ -water-solutions were measured. At low concentrations of acid the effect of electrolytic dissociation was observed. The results are in agreement with theory if one assumes complete or almost complete dissociation in  $H^+$  and  $SO_4^{2-}$  ions up to the concentration of 4% (by wt.). At high concentrations the increase of the absorption coefficient due to the hydration of  $H_2SO_4$  molecules was observed. A.

*Handwritten signature*

JANIK S. A.

POLON

519.133 519.185

6792. The existence of two OH-groups in H<sub>2</sub>SO<sub>4</sub>-molecules verified by the scattering of thermal neutrons.

J. A. JANIK, *Acta phys. Polon.*, 11, No. 3-4, 330-1 (1951-52).

The theory of Sachs and Teller [*Phys. Rev.*, 61, 18-27 (July 1, 1941)] which states that a neutron which is scattered by a proton bound in a molecule may cause this molecule to rotate, can also, with some small alterations, be applied to the scattering of slow neutrons by some liquids. It gives good agreement for H<sub>2</sub> and H<sub>2</sub>O. The experimental absorption coefficient of thermal neutrons in pure H<sub>2</sub>SO<sub>4</sub> is 1.26 cm<sup>-1</sup>. This is in good agreement with the value of 1.29 cm<sup>-1</sup>, which was calculated on the assumption that the molecule contained two OH groups capable of causing rotation of the molecule.

A. E. TAYLOR

*RM*



JANKI, J. A.

Poland

CA: 47:11826

Jagellonian Univ., Krakow, Poland

"Existence of hydroxyl groups in sulfuric acid molecules verified by the scattering of thermal neutrons."

Acta Phys. Polon. II, 330-1 (1953) (in English) cf. C.A. 47, 6268d

"APPROVED FOR RELEASE: 08/10/2001

CIA-RDP86-00513R000619510006-3

APPROVED FOR RELEASE: 08/10/2001

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*Handwritten mark*

APPROVED FOR RELEASE: 08/10/2001

CIA-RDP86-00513R000619510006-3"

JANIK, J.

"Scattering of Thermal Neutrons by Liquids; Scattering of Neutrons at 30° K Temperature by Molecules  $\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{I}$ "  
Byull. Polsk. AN Otd. 32, No 5, 1954, 223-225

The results of these measurements confirmed Kolos' theory (RZhFiz. 1955, 8735) that the cross sections of thermal neutrons for a molecule having internal rotation of one atom group in relation to the other is lower than the cross section for an immobile molecule. Experimental data of  $\text{CH}_3\text{J}$  concurred well with the results of R. G. Sachs and E. Teller (Phys. Rev. 60, 18, 1941). (RZhFiz, No 9, 1955)

SO: Sum-No 787, 12 Jan 56

The measures... were carried out with a... of the... (23)  
... by the... of the...  
... of the... of the...  
... of the... of the...  
... of the... of the...

JANKA JERZY A

IRML

✓ Modern methods of neutron counting. Jerzy A. Janku  
Pacępy Fiz. 5, 439-46(1954).—Modern equipment for  
fast and slow neutron counting, consisting of spark counters,  
photographic plates, and scintillation counters, is reviewed.  
19 references. Sylvia Nowinska

Amf

RCW

JANIK, JA.

P O L . 7

1251. Scattering of slow neutrons by CH<sub>3</sub>OH and CH<sub>4</sub> molecules. J. A. JANIK. *Zet. fiz. Polon.* 13, No. 3, 167-73 (1954).

Experiments on the scattering of slow neutrons by liquid molecules of a liquid show that the theory of Sachs and Teller may be applied to liquids. The cross-section for the scattering of slow neutrons is then dependent of the energy of the neutrons. This was verified for the CH<sub>3</sub>OH molecule using 10 eV and 30 K-neutrons. Measurements of the cross-section for CH<sub>3</sub>OH-molecules give the value  $(1.0 \pm 0.6) \cdot 10^{-28}$  cm<sup>2</sup> for 10 K-neutrons and  $(2.2 \pm 1.0) \cdot 10^{-28}$  cm<sup>2</sup> for 30 K-neutrons. The cross-section obtained from the theory of Sachs and Teller is  $2.4 \cdot 10^{-28}$  cm<sup>2</sup>. These results are interpreted in the influence of torsional oscillations between OH and CH<sub>3</sub> groups in the CH<sub>3</sub>OH-molecule in agreement with the theory given by W. Laves.

JANIK, J.

Poland

Inter-action between pi-mesons and nuclei

SO: Progress in Physics, Poland, Vol. 6, #3, 1955, Unclassified.

"APPROVED FOR RELEASE: 08/10/2001

CIA-RDP86-00513R000619510006-3

JANK J.

APPROVED FOR RELEASE: 08/10/2001

CIA-RDP86-00513R000619510006-3"

JANIS

Distr: 4E5c/4E3d

Spark counter applied to detection of slow neutrons. A. Czownicka and L. A. Janik (Univ. Krakow, Poland). *Zeszyty Nauk. Univ. Jagiel., Ser. Nauk Mat.-Przyrod., Mat.-Fiz., Chem.* No. 2, 3-38 (1958) (English summary).  
 A spark counter of the Rosenblum type is adapted for detection of slow neutrons. The anode consists of 6 wires, 0.08 mm. in diam.; the cathode, 1.5 mm. below, is a Cu plate covered with a B layer. The curve, counts vs. voltage, has a plateau from 4000 to 5000 v., the cathode has to be exchanged after 2 weeks of work, and the yield is about 0.01%, but the construction is simple, the electromagnetic, mech., and acoustic disturbances have no noticeable effect, and the results are reproducible after an exchange of the cathode, cf. Savel, C.A. 46, 8982c. J. Stock

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Bok



JANIK J.A.

POLAND/Nuclear Physics - Installations and Instruments. Methods  
of Measurement and Research

C-2

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 19749

Author : Dzwonicka A., Janik J.A.  
Inst : Jagiellonian University, Krakow, Poland  
Title : Spark Counter for Slow Neutrons.

Orig Pub : Zesz. nauk. Uniw. Jagiell., 1956, No 6, 37-48

Abstract : A spark counter, which registers slow neutrons, has a cathode made of a copper plate, covered with boron, and an anode of six wires 0.08 mm in diameter, stretched at a distance of 1.5 mm above the plate. The plateau of the counter for neutron registration is approximately 1,000 volts. The center of the plateau is near 4500 volts. The counter efficiency is approximately 0.01% of slow neutrons incident on the cathode.

Card : 1/1

JANIK, J.

Neutrons as tools for the investigation of magnetic substances. p. 429.

POSTĘPY FIZYKI. (Polskie Towarzystwo Fizyczne) Warszawa, Poland. Vol. 9, no. 4,  
1958.

Monthly List of East European Accessions (EEAI) LC, Vol. 3, no. 8, August 1959.  
UNCL

POLAND/Atomic and Molecular Physics - Physics of the Molecule. D

Abs Jour : Ref Zhur Fizika, No 2, 1960, 3179

Author : Janik, J.A., Krasnicki, S., Murasik, A.

Inst : Institute of Nuclear Research, Jagiellonian University, Krakow; Institute of Nuclear Research, Warsaw, Poland

Title : The Influence of Polarization of Liquid Crystal Molecules on the Scattering of Slow Neutrons

Orig Pub : Acta phys. polon., 1958, 17, No 6, 483-487

Abstract : The authors investigate the influence of polarization of liquid-crystal molecules of n-azoxyanizol in a magnetic field on the scattering of slow neutrons. The change in the scattering cross section of beams of monochromatic neutrons with energies 0.031, 0.037, and 0.25 ev, due to polarization, was determined by comparing the coefficient passage of the beams through a liquid unpolarized and

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Card 2/2  
APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619510006-3

POLAND/Atomic and Molecular Physics - Physics of the Molecule. D

Abs Jour : Ref Zhur Fizika, No 2, 1960, 3178

Author : Janik, J.A., Maniawski, F., Rzany, H.

Inst : Institute of Nuclear Research, Krakow, Poland

Title : Theoretical Calculation of the Slow Neutron Scattering Cross Section of the Ethylene Molecule

Orig Pub : Acta phys. polon., 1958, 17, No 6, 489-490

Abstract : The theory of scattering of slow neutrons by molecules in the gas phase, developed by Krieger and Nelkin (Referat Zhur Fizika, 1958, No 8, 17603), is applied to the ethylene molecule. The results of the calculations in the energy interval of scattered neutrons from 0.005 to 0.07 ev, are in good agreement with the experimental data. For greater energies the theoretical curve lies somewhat below the experimental points. This discrepancy

Card 1/2

JANIK & JERZY A.

Scattering and thermalisation of neutrons by bound nuclei. p. 241-252

NUKLEONIKA. (Polska Akademia Nauk. Komitet do Spraw Pokojowego Wykorzystania  
Energii Jądrowej) Warszawa, Poland. Vol. 4, no. 3, 1959.

Monthly List of East European Accessions (EEAI) LC, Vol. 9, no. 2,  
Feb. 1960

Uncl.

INSTYTUT BADAN JADROWYCH PAN, WARSZAWA  
ZAKŁAD II W KRAKOWIE

14(12)

POL/44-60-3-7/16

AUTHOR: Janik, J., Major

TITLE: On Anti-Atomic Protection of Airfields

PERIODICAL: <sup>19</sup>Wojskowy Przegląd Lotniczy, 1960, Nr 3, pp 33 - 36

ABSTRACT: This article is based on the Soviet book entitled "Atomnaya Energiya v Aviyatsiyi i Raketnoy Tekhnikye" published by the Woyennoye Izdatelstvo of the Soviet Ministry of Defence in Moscow, in 1959. General rules for the designing of airfields with the purpose of making them as little vulnerable as possible to atomic bomb attacks are given. Plans of airfields designed accordingly are shown in Figures 1 and 2. Western achievements in construction of short take-off and vertical take-off aircraft which are independent from long runways are mentioned. For the

Card 1/2

29568

P/046/60/005/007/007/007  
D238/D304

26.2242

**AUTHORS:** Janik, Jerzy A., Janik, Janina, Kraśnicki, Szczęsny,  
Mańlowski, Franciszek, Murasik, Andrzej, Rżany, Henryk,  
Szkatuła, Antoni, Ściesiński, Jan, and Wanic, Adam

**TITLE:** On the scattering of thermal neutrons in molecules  
containing hydrogen

**PERIODICAL:** Nukleonika, v. 5, no. 7-8, 1960, 495 - 499

**TEXT:** Investigations carried out in this field can be divided into the following areas: 1) Verification of the neutron scattering theory by molecules of molecular gases. 2) Examination of the structure of liquids by determining how far the active cross sections obtained experimentally differ from neutron scattering derived from theory. 3) Neutron scattering on polarized molecules. 4) Neutron scattering by molecules which show an oscillation level in the region of thermal energy. After mentioning the T.I. Krieger- M.S.

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20568

On the scattering of ...

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Nelin formula for the active cross section of neutron scattering in an atom of a molecule as a function of the sample temperature, the geometric molecular structure and the neutron energy, the authors indicate the exhaustive calculations of Krieger and Nelkin -- to prove their theory -- for the molecules  $\text{CH}_4$  and  $\text{H}_2$  and which established their agreement with E. Melkonian's experimentally obtained data in the field of energy. Similar calculations have been carried out in the Cracow Center for the molecule  $\text{C}_2\text{H}_4$ , and the results compared with measurements made by Melkonian; as a result, an identical agreement has been established between experiments and theory (Ref. 3: J.A. Janik, F. Maniawski, and H. Rżany: Acta Phys. Polon. 17, 489, 1958). In addition measurements have been made in the EWA-reactor with gas molecules of  $\text{NH}_3$  (Fig. 2); in these an aluminum crystal was employed as neutron monochromator. Results obtained in this way conform fully with the Krieger-Nelkin theory (Ref. 4: J.A. Janik, J. Janik, and A. Wanic: Physica 26, 449, 1960).

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On the scattering of ...

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Fig. 2. Active cross-section of neutron scattering of  $\text{NH}_3$  molecules as a function of neutron energy.  $\circ$  - experiments for gaseous  $\text{NH}_3$ ;  $\bullet$  - experiments for liquid  $\text{NH}_3$ . Curve calculated on the basis of the Krieger - Nelkin theory for gaseous  $\text{NH}_3$ .

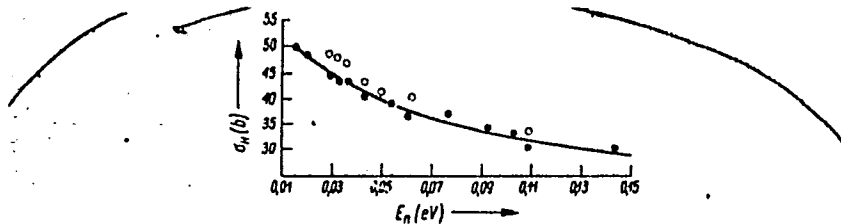


Abb. 2. Wirkungsquerschnitt auf die Neutronenstreuung der  $\text{NH}_3$ -Molekülen als Funktion der Energie der Neutronen.  $\circ$  - Experimente für den gasförmigen  $\text{NH}_3$ ;  $\bullet$  - Experimente für den flüssigen  $\text{NH}_3$ . Kurve berechnet auf Grund der Theorie von Krieger und Nelkin für den gasförmigen  $\text{NH}_3$ .

Card 3/8



20568

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On the scattering of ...

The results obtained by Melkonian on neutron scattering by water in a liquid state were compared with the Krieger-Nelkin theory for gaseous H<sub>2</sub>O. Measurements of neutron scattering in NH<sub>3</sub> and H<sub>2</sub>S were also carried out with the use of crystal monochromators (Ref. 5: A. Wanic: Acta Phys. Polon. 18, 255, 1959). The results obtained show a systematic increase of the active cross section as one passes from gases to liquids. These experimental facts can also be interpreted as answering the question, to what extent free molecular rotation is impossible in the fluid state. In the case of liquid water and ammonia, this determination is in agreement with the well known fact that the association in these liquids through hydrogen bonding is strengthened. In liquid hydrogen sulphide, for which there are inadequate physico-chemical data on hydrogen bonding evidence, the impossibility of free rotation is caused perhaps by a strong molecular packing. At the Cracow Center for Nuclear Physics, measurements have been made of the influence of molecular polarization, in which an easily polarizable liquid (in a crystal-fluid

Card 4/8

On the scattering of ...

Fig. 4.

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D238/D304

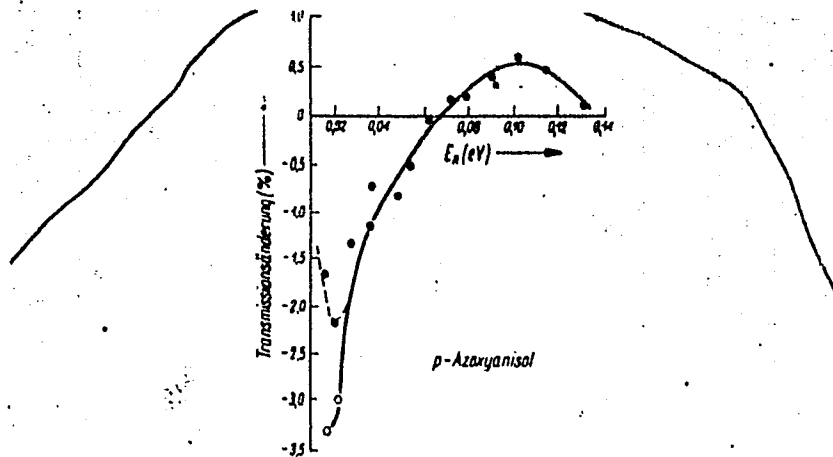


Abb 4. Transmissionsänderung der Neutronen als Funktion der Energie der Neutronen für den kristallflüssigen p-Azoxyanisol bei dem Übergang vom polarisierten zu unpolarisierten Zustand

Card 5/8

● — Experimentale Ergebnisse; o — nach der Korrektur für die Streuung der zweiten Ordnung

On the scattering of ...

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D238/D304

Fig. 4. (cont'd) Alteration of transmission of neutrons as a function of energy of the neutrons for liquid crystal para-azoxyanisol when passing from polarized to unpolarized state. ● - experimental results; ○ - after correction for scattering of the second order.

state), namely so-called P-Azoxyanizol has been used in the magnetic field. (Ref. 6: J. Janik, S. Kraśnicki, and A. Murasik: Acta Phys. Polon. 17, 483, 1958). The results of initial measurements have already been published (Ref. 6: Op.cit.) and further measurements are in progress. The main results are presented in Fig. 4. Experimental points and the curves drawn through them represent the percentage alteration in test transmission due to polarization of its molecules by a magnetic field, in relation to the decrease of polarization. This change is, as can be seen, a function of the energy of neutrons and indeed causes the neutron polarization of the sample; in the case of low energies a lowering and in the case of high energies a rise of neutron transmission occurs. This rela-

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On the scattering of ...

tionship can be explained to a semiquantitative degree on the basis of the Krieger-Nelkin theory; it is necessary to assume here that the CH<sub>3</sub> groups at the end of the p-azoxyanisol molecule carry out a restricted rotational movement about the co-axis, while on the other hand the whole molecule carries out free rotation about the longitudinal axis. Where molecules have an oscillatory level in the energy region, one should expect a local maximum of the relationship between active cross sections and neutron scattering of the energy of these neutrons. This maximum should appear for the particular neutron energy which is necessary to create this oscillation level. Measurements have been made for liquid CH<sub>3</sub>SH and, in fact, a local maximum of active cross section has been obtained where the level of oscillation of the internal restricted rotation was located. Measurements for gaseous CH<sub>3</sub>SH are in progress; it can be already stated that in gaseous methylmercaptan there are two further local maxima in the vicinity of restricted rotation which could be shown as proof of the existence of levels of restricted rotation.

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On the scattering of ...

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D238/D304

This research was carried out in the EWA-reactor in Swierk with the aid of a slow chopper built by the Cracow Center for Nuclear Physics. There are 4 figures and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc. Abstractor's note: This article is written in German.

ASSOCIATION: Polnische Akademie der Wissenschaften, Institut für Kernforschung, Warszawa;  
Neutronenlaboratorium des Krakauer Zentrums für Kernphysik (Polish Academy of Sciences, Warsaw Institute of Nuclear Research;  
Neutron Laboratory of the Cracow Center for Nuclear Physics)

SUBMITTED: May 9, 1960

Card 8/8

4

JANIK, J. A.

Liquid crystals. Postepy fizyki 11 no.5/6:551-564 '60.

1. Instytut Fizyki Uniwersytetu Jagiellonskiego, Krakow.

25462

P/047/61/012/004/002/002  
D238/D304

24.6100

AUTHOR: Janik, J.A.

TITLE: Neutrons as a tool of investigating the mechanism of self-diffusion of liquids

PERIODICAL: Postępy fizyki, v. 5, no. 4, 1961, 466 - 76

TEXT: The methods of studying the molecular structure by means of neutron scattering have been recently extended to new problems of molecular dynamics of liquids, and investigations have been reported on phonons and rotons in superfluid Helium II, the frequency spectra of vibrational motion, and the phenomenon of self-diffusion of liquids. The present state of the latter problem is reviewed by the author. In the experimental part of the article neutron energy selectors and analyzers are briefly described. It is stated that the requirement of very high neutron flux, necessary for simultaneous determination of both the energy-and angular-dependence of the neutron scattering

Card 1/3

Neutrons as a tool...

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X

cross-section,  $d^2\sigma/d\Omega dE$ , presents the most serious difficulty since the neutron fluxes of most experimental reactors are inadequate. However, much valuable information can be obtained from simple scattering experiments at a fixed angle. This is followed by a discussion of the phenomenon of self-diffusion based on the gas and crystalline models of liquid structure and the respective mechanisms of molecular transport by continuous diffusion and diffusion by large independent jumps. It is shown how it is possible to decide which one of the two mechanisms prevails by comparing the coefficient of diffusion derived from the width of the scattering peak with results obtained by radioactive tracers or by the paramagnetic nuclear resonance. The dependence of the neutron scattering cross-section upon the mechanism of self-diffusion is discussed by following G.H. Vineyard's theory (Ref. 4: Phys. Rev. 110, 999, (1958)) of continuous diffusion, and for diffusion by large independent jumps of the crystalline model the formula for broadening of the quasi-

Card 2/3



25462

P/047/61/012/004/002/002  
D238/D304

Neutrons as a tool...

elastic peak is quoted following Singwi and Sjölander. The presented experimental results include scattering by water and liquid lead of cold neutrons from a Beryllium filter. These are shown to disagree seriously with earlier results obtained with neutrons of higher energy from a crystal selector, and possible reasons for this discrepancy are considered. There are 4 figures and 11 references: 3 Soviet-bloc and 8 non-Soviet-bloc. The 4 references to English-language publications read as follows: G.H. Vineyard, Phys. Rev., 110, 999 (1958); K.S. Singwi, A. Sjölander, Phys. Rev., 119, 863 (1960); H. Palevsky, "Proceedings of the symposium on inelastic scattering of neutrons by solids and liquids," Vienna 1960, (IS/29); I. Pelah, W.L. Whittemore, A.W. McReynolds, Phys. Rev., 113, 767 (1959).

ASSOCIATION: Instytut fizyki uniwersytetu Jagiellońskiego;  
Instytut fizyki jądrowej Polskiej akademii nauk,  
Kraków (Institute of Physics, Jagiellonian  
University, Institute of Nuclear Physics of the  
Polish Academy of Sciences, Cracow)

Card 3/3

JANIK, J. A.

Neutrons as a tool in the research on the autodiffusion mechanism in liquids. Postepy fizyki 12 no.4:467-476 '61.

1. Instytut Fizyki Uniwersytetu Jagiellonskiego i Instytut Fizyki Jadrowej Polskiej Akademii Nauk, Krakow.

P/045/61/020/008/003/004  
R109/B202

AUTHORS: Janik, Janina, and Janik, Jerzy A.

TITLE: Determination of the density of liquids and their saturated vapors as a function of temperature at pressures above one atmosphere. Part I. Measurements with ammonia

PERIODICAL: Acta Physica Polonica, v. 20, no. 8, 1961, 679-690

TEXT: K. Bennowitz and J. J. Windisch, (Z. phys. Chem., 166, 401 (1933)) described a method for measuring the density of liquids. A small magnet is dipped into the liquid where it is kept floating by means of an electromagnetic coil fastened outside. This method has been improved and the density of ammonia can now be determined with a mean error of only  $\pm 7 \cdot 10^{-4}$  g/cm<sup>3</sup>. This high accuracy is necessary for studying neutron scattering in liquids and gases. The apparatus is shown in Fig. 1: A - brass vessel, S - coil with 1190 windings, length 57 mm, inner diameter 15 mm, outer diameter 36 mm, R<sub>1</sub> - experimental tube produced from "Rasotherm" glass, inner diameter 3.87 mm, wall thickness approximately

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3 mm, B - heat insulation, P - float 5 mm long, 2 mm diameter,  $W_1$  and  $W_2$  are observation windows for determining the moment at which the float rises from the bottom,  $R_2$  experimental tube for measuring the density of the saturated vapor,  $W_3$  observation window. The amperage in the coil at which the float rises from the bottom is measured by an ammeter of accuracy index 0.5. Liquids of known density were used for the calibration of this apparatus; an exact linear dependence was found to exist between the square of the current density in the coil and the density of the liquid investigated. Synthetic ammonia was used to measure the temperature dependence of the density of ammonia produced by the factory "Azoty" in Kędzierzyn which had been distilled prior to being filled into the experimental tube. When measuring the density of the saturated vapor the spheroidal shape of the lower part of the tube as well as the shape of the meniscus of the free surface of the liquid have to be taken into account. If  $m_c$  is the mass of the liquid,  $m_g$  the mass of the vapor,  $m = m_c + m_g$ ,  $v$  the volume of the tube,  $v_c$  the volume of the liquid phase in the tube,  $d_t^c$  the density of the liquid phase of the substance, then

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5 tables, and 12 references: 10 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Laboratory of Physical Chemistry and Electrochemistry,  
Jagellonian University, Cracow. Institute of Physics,  
Jagellonian University, Cracow

SUBMITTED: March 12, 1961

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P/045/61/020/008/004/004  
B109/B202

AUTHORS: Janik, Janina, and Janik, Jerzy A.

TITLE: Determination of the density of liquids and their saturated vapors as a function of temperature at pressures above one atmosphere. Part II. Measurements with methyl mercaptan

PERIODICAL: Acta Physica Polonica, v. 20, no. 8, 1961, 691-699

TEXT: Using the method given by the authors (Ref. 1: Acta physica Polon., 20, 679 (1961)) and Bennewitz, K., Windisch, J. J. (Z. phys. Chem., 166, 401 (1933)) the density of liquid mercaptan and its saturated vapor as a function of the temperature was determined in the range 20-80°C since its exact knowledge is necessary for the study of neutron scattering. Water, aqueous solution of phosphoric acid, aqueous solutions of ethyl ether, ethyl alcohol, methyl alcohol, and solutions of ethyl ether in methyl alcohol were used to calibrate the apparatus described in Ref. 1. Vaseline oil served as thermostatic liquid since at higher temperatures, the electric conductivity of water is too high. Vaseline oil was applied because of its relatively low viscosity causing a sufficiently fast

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circulation and preventing temperature gradients in the measuring vessel. CH<sub>3</sub>SH produced by the method of Arndt, F. (Berichte d. Chem. Ges., 54, 2236 (1921)) which had been twice distilled in the vacuum and then, again in the vacuum, was distilled into the experimental tube (cooling substance solid CO<sub>2</sub>) was used for the measurements. The results of measurements are given in Table III (mean error  $\pm 0.0002$  g/cm<sup>3</sup>). Good agreement is obtained with the values given by Berthoud, A., Brum, R., (Ref. 4: J. Chim. phys., 21, 153 (1924)) and those published in the Handbook of Chemistry and Physics 41 ed., (1959) p. 1097, 2305. The density of the saturated CH<sub>3</sub>SH vapor was determined according to formula (2) in Ref. 1. The results of measurement are given in Table IV. These values are much better than the data given in Ref. 4 for the range between 43.5°C and 92.7°C. The authors assume that Berthoud and Brum determined the value for 92.7°C incorrectly. An additional argument which supports their assumption is the fact that when regarding the results of Berthoud and Brum in the vicinity of 90°C as correct one obtains an unsatisfactory result from experiments on the neutron scattering by CH<sub>3</sub>SH. The deviation of points calculated on the

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basis of data by Berthoud and Brum in the vicinity of the critical point is incomprehensible and perhaps due to experimental errors. For this reason it may be suspected that the value of  $0.3315 \text{ g/cm}^3$  given in Ref. 4 for the critical density was also incorrectly determined. Assuming that a straight-line dependence of  $(d_t^g + d_t^c)/2$  on temperature holds up to the critical point and plotting this line on the basis of data of the present study, one obtains a value of  $0.3225 \text{ g/cm}^3$  (assuming  $196.8^\circ\text{C}$  as the critical point) for the critical density of methyl mercaptan. The authors thank J. Korohoda for her help in the measurements and to S. Moroz for valuable technical help. There are 4 figures, 5 tables, and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Laboratory of Physical Chemistry and Electrochemistry,  
Jagellonian University, Cracow. Institute of Physics,  
Jagellonian University, Cracow.

SUBMITTED: March 12, 1961.

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TUBBS, N.; SAGAN, U.; RZANY, H.; JANIK, J.A.; JANIK, J.

The total scattering cross section of slow neutrons in gaseous  
 $H_2S$ . Inst fiz jadr report no.160:1-6 J1 '62.

1. Exeter College, Oxford (for Tubbs). 2. Instytut Fizyki Jadrowej  
Krakow (for all except Tubbs).

JANIK, J.A.; RZANY, H.; SCIESINSKI, J.

Scattering of slow neutrons by  $\text{NH}_3$  molecules. Pt. 2. Scattering by liquid  $\text{NH}_3$ . Inst fiz jadr report no.214:1-5 0 '62.

1. Instytut Fizyki Jadrowej, Krakow,

TUBBS, N.; SAGAN, U.; RZANY, H.; JANIK, J.A.; JANIK, J. (Mrs.)

The total scattering cross section of slow neutrons in gaseous  $H_2S$ . Acta physica Pol 22 no.6:517-520 D '62.

1. Institute of Nuclear Physics, Krakow.

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P/0047/63/014/002/0167/0190

ACCESSION NR: AP3001751

AUTHOR: Janik, Jerzy A.

TITLE: Neutron scattering on molecular systems

SOURCE: Postepy fizyki, v. 14, no. 2, 1963, 167-190

TOPIC TAGS: Krieger-Nelkin gas particles, NH sub 3, H sub 2, water scattering neutron, scattering, scattering by solid, methane, cold neutron, chopper, time of flight method, neutron scattering

ABSTRACT: This is a descriptive review of literature on the subject of neutron scattering on molecular systems. All figures of the article are reproductions from original papers quoted by the author. The fundamental theory of Fermi is first given, followed by modifications and contributions of Sachs, Teller, Kolos, Glauber, and others. Curves are reproduced showing scattering of CH<sub>4</sub> neutrons at various energies of impinging neutrons and various angles of scattering. Experimental methods used by investigators in the study of neutron scattering are outlined. These are: the crystal monochromatizing, the chopper-time of flight method, and the use of beryllium filter for production of cold neutrons.

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JANIK, J.A.; JANIK, J.M.

Total neutron scattering cross section study of molecular motions in dimethoxyazoxybenzene (p-azoxyanisole). Acta physica Pol 25 no.6:845-848 Je '64.

1. Institute of Nuclear Physics, Polish Academy of Sciences, Krakow, (for Janik J.A.). 2. Institute of Physical Chemistry and Electrochemistry, Jagiellonian University, Krakow (for Janik, J.M.).

JANIK, J.A.

Molecular dynamics investigated by neutron scattering. Inst  
fiz jadr report no.368:1-34 '64.

1. Institute of Nuclear Physics, Krakow, of the polish Academy  
of Sciences.

JANIK, J.A.; JANIK, J.M.

Total neutron scattering cross section study of molecular motions in dimethoxyazoxybenzene (p-azoxyanisole). Acta physica Pol 25 no.6:845-848 Je '64.

1. Institute of Nuclear Physics, Polish Academy of Sciences, Krakow, (for Janik J.A.). 2. Institute of Physical Chemistry and Electrochemistry, Jagiellonian University, Krakow (for Janik, J.M.).

JANIK, J.; KREBS, M.

Seminar on piezoelectricity in Liberec. Cs cas Fyz 14 no.2:  
157-158 '64

1. Katedra fyziky, Vysoka skola strojni a textilni, Liberec.



JANIK, Ladislav

Third Seminar on Piezoelectricity at the Higher School of Mechanical and Textile Engineering in Liberec. Cs cas fys 15 no.2:174-175 '65.

1. Chair of Physics of the Higher School of Mechanical and Textile Engineering, Liberec. Submitted August 22, 1964.

HOJA, S.; JANIK, M.

Dynamics of changes in isolated surviving muscle fiber. Bratisl.  
lek. listy 44 no.8:473-477 '64.

I. Katedra hygieny Lek. Fak. Univerzity Komenského (veduci akademik  
V. Mucha, veduci prof. MUDr. V. Vrsansky).

Z/009/61/C00/001/002/006  
E112/E153

AUTHOR: Janík, Miroslav

TITLE: Semi-industrial Production of Furnace Blacks from  
Hydrocarbon Oil

PERIODICAL: Chemický Průmysl, 1961, No.1, pp.8-12

TEXT: A semi-technical experimental plant to study problems of carbon black (furnace black) production from hydrocarbon oils was installed at the Urx Works in 1959 and the present paper discusses a few aspects of the process. A diagrammatical sketch of the plant is shown, (Fig.1) where 1 - storage tank, 2 - toothed feeder, 3 - melting pot, 4 - vaporizer, 5 - cooling coil, 6 - preheater for coke-oven gases, 7 - reaction vessels, 8 - circulator for gas mixture, 9 - air circulator, 10 - furnaces, 11 - cooling tower, 12 - furnace (Soviet type), 13 - electrofilters, 14 - suction fans, 15,16,17 - cyclones of different construction, 18 - exhaust fan, 19 - pneumatic transport of carbon black. Anthracene oil, the physical constants of which are given, was used as raw material. It was fed directly into the reaction vessel or, if solid, into the

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Semi-industrial Production of Furnace Blacks from Hydrocarbon Oil

melting pot and vaporizer, which was supplied simultaneously with preheated coke-oven gases, saturated with vapours of high-boiling hydrocarbons. Three furnaces were connected to the hydrocarbon supply, one of which was an older type of Soviet construction (12 in Fig.1). The main attention was paid to processes inside retorts (10). These were of cylindrical shape and lined with refractory bricks, their end-parts connecting to a preheater which utilizes the heat of combustion for the heating of the air. The reaction products were led, after cooling, to electrofilters and cyclones, where the carbon black was separated from the gaseous by-products. The anthracene oil was atomized by means of special injector burners prior to its conversion to carbon black. About 200 different samples of carbon black were produced under varying plant conditions and were then evaluated according to physical and chemical characteristics and practical tests in the rubber industry. Chemical tests were: oil number, ash contents, pH of carbon black slurry, iodine absorption, moisture content, acetone extracts, analyses of exhaust gases. Results are not given.

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