

L 38519-65 EPF(c)/EPF(n)-2/EPR/EGG(j)/EWF(m)/EWP(b)/IWP(t) Pr-U/PS-U/Pu-U

IJP(c) JD

ACCESSION NR: AP5007135

S/0314/65/000/002/0027/0039/0

AUTHOR: Narinskiy, G. B.; Krakovskiy, B. D. (Engineer)

TITLE: Fractionation of air with and without recovery of argon

SOURCE: Khimicheskoye i neftyanoye mashinostroyeniye, no. 2, 1965, 27-30

TOPIC TAGS: air fractionation, argon recovery, nitrogen production, oxygen production

ABSTRACT: On the basis of thorough experimental investigations at the VNIKIMASH, an exact equilibrium diagram of the system oxygen - argon - nitrogen was plotted. It was shown that this diagram can be used to calculate data on the distribution of components on the plates of air-separation columns that are close to the actual experimental data. The article gives the results of calculations of the fractionation process in a typical double-fractionation apparatus performed for high-pressure units discharging the products in the gaseous form at atmospheric pressure. The results with and without the recovery of argon are compared for the same oxygen content. The number of theoretical plates is also determined.

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ACCESSION NR: AP5007135

process. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 00

ENCL: 00

SUB CODE: GC

NO REF SOV: 007

OTHER: 003

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L 61819-65 EWT(m)/EPF(c)/EWP(t)/EWP(b) Pr-4/Ps-4 IJP(c) JD

ACCESSION NR: AP5018282

UR/0314/65/000/007/0009/0012
66.048:546.217

20
B

AUTHOR: Narinskiy, G. B. ⁴⁴ (Candidate of technical sciences)

TITLE: Thermodynamic analysis of a high-pressure air-fractionating device with a liquid oxygen pump ₄₄

SOURCE: Khimicheskoye i neftyanoye mashinostroyeniye, no. 7, 1965, 9-12

TOPIC TAGS: air fractionating device, air fractionation thermodynamics, air fractionation, liquid oxygen pump

ABSTRACT: The present article outlines the theory and describes the determination of losses due to the irreversibility of the process in various separate elements of high-pressure devices containing air throttles. The two schematic diagrams shown in Figure 1 of the Enclosure represent devices with an oxygen compressor and with a liquid oxygen pump, respectively. Results are summarized in a table containing 24 separate loss entries. Orig. art. has: 23 formulas, 1 figure, and 1 table.

ASSOCIATION: None

SUBMITTED: 00

ENCL: 02

SUB CODE: GC, TD

NO REF SOV: 003

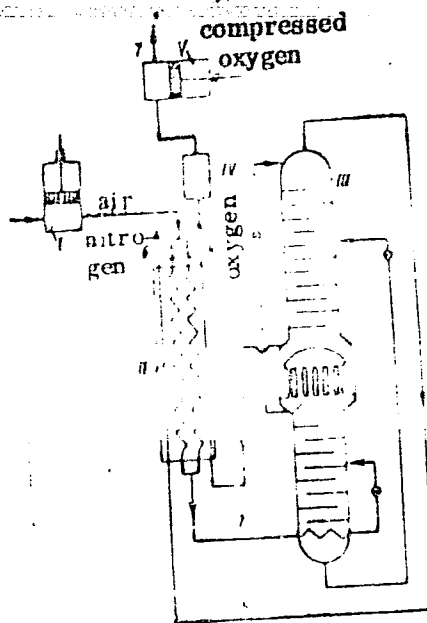
OTHER: 002

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L 61819-65

ACCESSION NR: AP5018282

ENCL: 01

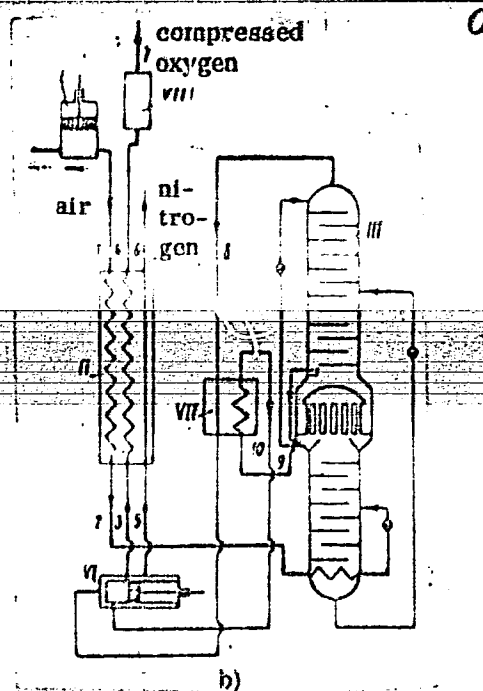


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 ACCESSION NR: AP5018282
 ENCL: 02

Figure 1. Schematic diagram of the high pressure air fractionating devices:

- a -- with an oxygen compressor;
- b -- with a liquid air pump;
- I -- air compressor;
- II -- heat exchanger;
- III -- device for double fractionating;
- IV -- gas tank;
- V -- oxygen compressor;
- VI -- liquid oxygen pump;
- VII -- supercooler;
- VIII -- container for compressed oxygen (devices for air purification are omitted).



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L 36287-66 EWT(d)/EWT(m)/EWP(k)/EWP(v)/EWP(t)/EWP(l)/ETI/EWP(h) IJP(c) WW/JW/JD

ACC NR: AT6016840

(A)

SOURCE CODE: UR/2800/65/000/010/0003/0046

AUTHOR: Yepifanova, V. I. (Doctor of technical sciences); Gorokhov, V. S. (Engr.); Chernyshev, B. A. (Engr.); Narinskiy, G. B. (Candidate of technical sciences)

ORG: None*

9
3+1

TITLE: The VNIKIMASH BR-6 nitrogen oxygen apparatus

SOURCE: *Vsesoyuznyy nauchno-issledovatel'skiy institut kislородnogo mashinostroyeniya, Trudy, no. 10, 1965. Apparaty i mashiny kislородnykh ustanovok (Apparatus and machinery of industrial oxygen plants), 3-46

TOPIC TAGS: liquid nitrogen, liquid oxygen, chemical plant equipment, chemical production

ABSTRACT: The authors describe in considerable detail the VNIKIMASH BR-6 apparatus developed by the All-Union Scientific-Research Institute of Oxygen Equipment Building (Vsesoyuznyy nauchno-issledovatel'skiy institut kislородnogo mashinostroyeniya) for the production of 15,000 m³/hr of nitrogen containing 0.002% O₂, 7840 m³/hr of industrial oxygen with a concentration of 95% O₂, and 160 m³/hr of 99.5% pure O₂. The apparatus operates with a single low pressure circuit, used previously in technical oxygen devices only. The paper discusses

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UDC: 62-1:661.935

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ACC NR: AT6016840

the basic features of the apparatus and the selection and development of the technological design of the unit and technological diagrams. The following main components are treated in detail: regenerators, carbon dioxide freezing traps, fractionating columns, condensers-evaporators, supercoolers, N and O reheaters, technical oxygen column, block housing, armature, compressed-gas motor, and the remote and automatic control system. The results of a test run of the apparatus are presented. The article concludes with a brief comparison of the apparatus with the characteristics of the "Linde" (West Germany) and "Kobe-Steel" (Japan) devices. The BR-6 is already in use in chemical enterprises of the Soviet Union, Rumania, Hungary, and Bulgaria. Orig. art. has: 16 figures and 5 tables.

SUB CODE: 07/ SUBM DATE: 00/ ORIG REF: 007

Card 212 *HS*

ACC NR: AR6032311 SOURCE CODE: UR/0081/66/000/010/L007/L007

AUTHOR: Yepifanova, V. I. ; Gorokhov, V. S. ; Chernyshev, B. A. ; Narinskiy, G. B.

TITLE: Nitrogen-oxygen plant VNIKIMASH BR-6

SOURCE: Ref. zh. Khimiya, Part II, Abs. 10L55

REF SOURCE: Tr. Vses. n. -i in-ta kriogen., kislородn. i kompressorn. mashinostr., vyp. 10, 1965, 3-46

TOPIC TAGS: nitrogen, oxygen, oxygen plant, nitrogen plant

ABSTRACT: The technical characteristics of the equipment are given and its basic features are pointed out. The flow chart is presented and the basic equipment is analyzed. A comparison is made of the VNIKIMASH BR-6 plant with those manufactured by foreign firms. Orig. art. has: 7 reference items. M. Gusev. [Translation of abstract]

SUB CODE: 07/

Card 1/1

NARIN-SIZ G.S., kand. tekhn. nauk; KRAKOVSKIY, B.D., inzh.; KAZUKOVA,
Y.A., inzh.

Studying the process of air separation with recovery of crude
argon as applied to low-pressure units. Trudy VNIKIMASH
no.10:47-68 '65. (MIRA 18:9)

L 1653-66 EWT(m)/EPF(c)/EWP(j)/T/EMP(t)/EMP(b)/ETC(m) LJP(c) DC/JD/WA/JA/RM

ACCESSION NR: AP5021421

UR/0076/65/039/008/2009/2015

541/.545

AUTHOR: Narinskiy, G. B. ^{44,55}

TITLE: Apparatus for studying liquid - vapor equilibrium in an oxygen - argon - nitrogen system _{27 27}

SOURCE: ²⁷ Zhurnal fizicheskoy khimii, v. 39, no. 8, 1965, 2009-2015

TOPIC TAGS: oxygen, nitrogen, argon, phase equilibrium ^{44,55}

ABSTRACT: The experimental setup and procedure used for studying the liquid - vapor equilibrium in the ternary system O₂ - Ar - N₂ and in the corresponding binary systems at low temperatures are described. The circulation method was employed, and liquid oxygen and liquid nitrogen were used to maintain temperatures of 90.5-135°K and 80-90.5°K respectively in the cryostat. The analysis of the binary and ternary samples is fully described. Experiments conducted at pressures close to atmospheric in the equilibrium vessel yielded good results at a circulation rate of 0.65 l/min. It was found that in order for equilibrium conditions to be reached, the circulation rate should be inversely proportional to the square root of the pressure in the

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ACCESSION NR: AP5021421

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equilibrium vessel. Thus, the following basic parameters were selected for the study of the liquid - vapor equilibrium: circulation rate, $0.4/\sqrt{p}$, l/min; amount of liquid phase in the equilibrium vessel, 60-65 cm³; circulation time, 50 min; rate of withdrawal of liquid sample, 0.3-0.5 l/min. The correctness of this choice of conditions was confirmed by a thermodynamic treatment of the data. "V. G. SKripka, E. V. Ardasheva, N. S. Minayeva, and I. I. Tulyanskaya participated in the work."

Orig. art. has: 3 figures and 2 formulas.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut kislородnogo mashinostroyeniya (All-Union Scientific Research Institute of Oxygen Apparatus and Machinery)

SUBMITTED: 06May64

ENCL: 00

SUB CODE: GC

NO REF SOV: 013

OTHER: 001

Card 2/2 BP

ACC NR: AR6035070

SOURCE CODE: UR/0282/66/000/008/0052/0053

AUTHOR: Yepifanova, V. I.; Gorokhov, V. S.; Chernyshev, B. A.;
Narinskiy, G. B.

TITLE: VNIKIMASH BR-6 nitrogen and oxygen plant

SOURCE: Ref. zh. Khimicheskoye i kholodil'noye mashinostroyeniye, Abs.
8. 47. 369

REF SOURCE: Tr. Vses. n. -i. in-ta kriogen., kislородn. i kompressorn.
mashinostr., vyp. 10, 1965, 3-46

TOPIC TAGS: nitrogen, oxygen, ammonia

ABSTRACT: The All-Union Scientific-Research Institute for Oxygen Equipment developed a VNIKIMASH type BR-6 machine designed to produce 15,000 m³ per hour of nitrogen with a 0.002% content of O₂; 7840 m³ per hour of low-purity oxygen with 95% O₂; and 160 m³ per hour of high-purity oxygen with a 99.5% concentration of O₂. As a basis for the development of the new equipment, the designers used the G-6800 air-fractioning unit with production capacity of 5400 m³/hr of nitrogen with 0.02-0.05% O₂, and 1400 m³/hr of oxygen with a

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UDC: 621.59

ACC NR: AR6035070

90—92% concentration of O₂. The latter did satisfy the industrial demands for ammonia with respect to both quality and quantity as well, or with regard to the flow chart and equipment. The new BR-6 plants have been providing adequate supplies of pure nitrogen and technical oxygen to synthetic ammonium other chemical plants. The BR-6 plant consists of several air turbocompressors an air-fractioning unit, turboexpanders, a controlling and measuring instrument panel, switching mechanism, preheaters, and other equipment. Unlike the G-6800 machine operating at two pressure levels, the BR-6 nitrogen-oxygen plant is designed for a low pressure level, a system used earlier only in technical oxygen plants. The low-pressure system makes it possible to eliminate reciprocating engines, chemical air purifiers for removing carbon dioxide from the air, an ammonium refrigeration unit, and reversible heat exchangers for freezing out the moisture thus resulting in a highly efficient unit, simple in construction and dependable and convenient in operating. The principal considerations in designing the BR-6 plant were (on comparison basis) a flow chart with an improved organization of heat exchange, removal of air impurities, rectification, and refrigeration cycle. Orig. art. has: 7 bibliographic titles, and 16 diagrams. [KP]

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End

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