of the coefficient of electron emission in conditions of high magnetic field is described. The equipment can be used for identification of multiply charged ions in mixed beams.
U A Arifov et al, *United Inst Nucl Res, Lab Nucl Reactions, P7* 6165, *Dubna* 1971, 1–20 (*in Russian*).

18

332. Investigation of high-frequency discharge in helium with special consideration of helium purity. (Germany)
Contraction of the positive column of a high-frequency discharge in helium at pressures above 2 torr is investigated in dependence on small additives of electropositive and electronegative gases. An experimental vacuum system with base pressure of 1×10^{-8} torr was used for the experiments. Helium was purified by low-temperature adsorption on zeolite 5A. Purity of helium was 99.99995 per cent as determined by spectral analysis. On addition of Ar, Ne, N_2 and C_2H_2 no change of the contraction was observed while O_2 and F_2 additions resulted in increased contraction.
H Schon, *Exper Tech Phys*, **20** (2), 1972, 181–193 (*in German*).

18

333. Experimental investigation of the influence of various ambients on the impulse emission of an oxide cathode. (USSR)
Experimental data on the influence of atmosphere and forevacuum on the emission of an oxide cathode are presented. Additional activation renews the emission properties of the oxide cathode after storage in air in a cold state for up to 15 h. Storage in forevacuum does not affect the emission. Exposure to air of an activated cathode, heated by a 4 V heater voltage, reduces the emission.
G A Polotay and V U Bagdasarov, *Trans Moscow Inst Electronic Equipment Construction, No* 20, 1972, 67–78 (*in Russian*).

II. Vacuum apparatus and auxiliaries

20. PUMPING SYSTEMS

20

334. High-vacuum aggregate with oil-free pumping type PEM-02. (USSR)
The oil-free pumping aggregate type PEM-02 has a pumping speed of 2000 litres/s in the pressure range of 10^{-4} to 10^{-7} torr and an ultimate pressure of 1×10^{-8} torr. The coefficients of compression of gas for nitrogen and helium were measured separately for each stage of the pump. The total coefficient of compression, determined as a product of the coefficients for three stages, is in the range 2×10^8 to 6×10^9 for nitrogen. The spread of measured values is determined by the influence of desorption processes in working channels of the pump. Increasing the backing pressure to 1 to 3×10^{-1} torr does not influence the pumping characteristics if the increase is not due to hydrogen partial increase pressure. A hydrogen partial pressure at the forepump side considerably decreases the dynamic rarefaction at the intake port of the pump and the effective pumping speed for hydrogen.
V S Kondrashev et al, *Trans Moscow Institute Electronic Equipment Construction, No* 20, 1972, 94–99 (*in Russian*).

21. PUMPS AND PUMP FLUIDS

21

335. Pumping of carbon dioxide by adsorption pump. (USSR)
Carbon dioxide pumping by a high-vacuum adsorption pump is investigated. Free surface of nitrogen container was 190 cm^2 and 240 g of active charcoal was placed in a 10 mm layer in the adsorption cavity. Kinetic curves which represent the time dependence of pressure at the intake port of the pump with constant admission rate of the tested gas. The kinetic curves in each pressure range between 10^{-9} to 10^{-6} torr were recorded using a compensation recorder. It was found that the adsorption pump possesses a rather small steady pumping speed for carbon dioxide at pressures below the vapour pressure of carbon dioxide due to extremely slow diffusion of gas in adsorbent.
A I Volchkevich, *Trans Moscow Institute of Electronic Equipment Construction, No* 20, 1972, 88–93 (*in Russian*).

22. GAUGES

22

336. Indicator for changes in gas flow based on a photodiode. (Rumania)
An indicator of gas flow change in a vacuum system is described. The indicator consists of a mercury flowmeter, source of light, photodiode and amplifier.
N N Ceausescu, *Stud Cerc Fiz*, **23** (10), 1971, 1235–1239 (*in Rumanian*).

22

337. Possibilities of using the ionization vacuum gauge as a vacuum measuring standard. Part II. (Czechoslovakia)
Properties of hot cathode ionization gauge heads are analyzed and the influence of geometry, cathode emission, envelope potential, thermal conditions and pumping effects on the reading of the gauge is discussed. It is concluded that ionization vacuum gauges of the Bayard-Alpert type can be used as secondary standards. The classical types can be used in the range of 10^{-4} to 10^{-8} torr and the new types with external collector can be used in the range of 10^{-8} to 10^{-11} torr. The types of ionization vacuum gauges with high sensitivity (Lafferty, orbitron) are not at the present time suitable as secondary vacuum standards.
A Blaha, *Jemna Mech Optika*, **17** (5), *May* 1972, 121–125 (*in Czech*).

23. PLUMBING

23

338. Methods and criteria for comparison of demountable vacuum seals. (USSR)
Methods and criteria for comparison of demountable vacuum seals are considered from the viewpoint of reliability and technology. Normalization and unification of vacuum seals are discussed, as well as the construction of vacuum apparatus for physical investigations.
K I Bespalov et al, *Trans Moscow Inst Electronic Equipment Construction, No* 20, 1972, 156–161 (*in Russian*).

23

339. Hermetic motion feedthroughs in high-vacuum. (USSR)
The application of hermetic bellows-sealed feedthroughs for motion transfer in vacuum is considered. Constructions of motion feedthroughs are described and optimum conditions of operation are determined.
E V Rudnev, *Trans Moscow Inst Electronic Equipment Construction, No* 20, 1972, 79–87 (*in Russian*).

23

340. Basic elements of the mechanism of hermetization of high vacuum seals. (USSR)
A pyramid model with peaks in one level of the treated surface is presented. The problems of the influence of physico-mechanical properties of the gasket material, degrees of roughness of both contacting surfaces, and the applied sealing force, on the leakage of the intersurface band of contacting metals, are considered.
G G Stratinevskiy, *Trans Moscow Inst Electronic Equipment Construction, No* 20, 1972, 34–44 (*in Russian*).

27. LEAK DETECTORS AND LEAK DETECTION

27

341. Investigation of gas permeation through flexible envelopes by wave transmission in vacuum under conditions of dynamic and thermal loads. (USSR)
A technique of investigating gas permeation through flexible envelopes by wave transmissions in vacuum under dynamic and thermal loads has been developed. The method is based on application of test gas, helium, and measuring the helium partial pressure in the vacuum system by an omegatron residual gas analyzer.
A T Aleksandrova et al, *Trans Moscow Inst Electronic Equipment Construction, No* 20, 1972, 146–155 (*in Russian*).

III. Vacuum applications

30. EVAPORATION AND SPUTTERING

30

342. Deposition of thin films of CdS in plasma of gas discharge at low pressure. (USSR)
Thin films of CdS were deposited on different substrates by triode sputtering in the plasma of a gas discharge at low pressure. Properties of the films are investigated.
L L Nassonova et al, *Electron Technol, Scient-tech Coll, Technol Organization Production No* 6, 1971, 76–79 (*in Russian*).

30

343. Initial stage of condensation of metals. (USSR)
Critical thickness of films of Pb, Bi and Sb during their condensation in vacuum from molecular and partially ionized beams is determined. It is found that the critical thickness is reduced at condensation from ionized beam.
B N Ilin et al, *Zh Fiz Khim*, **46** (1), 1972, 247–248 (*in Russian*).