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263. Auger electron spectrometer combined with an LEED system. (USSR)
Construction of a metallic Auger electron spectrometer is described. It is combined with an LEED system and spectra of characteristic energy losses of reflected electrons can also be determined. The instrument enables quantitative analyses of chemical composition and atomic structure of solid surfaces in the temperature range −193 to 1500°C to be carried out during the course of cleaning, catalysis, growth, emission, adsorption, oxidation and evaporation performed in the working chamber of the spectrometer. Atomically clean surfaces can be obtained by cleavage in ultra-high vacuum, high-temperature treatment and ion bombardment with subsequent annealing. The vacuum system of the instrument providing 1×10^{-10} torr with the aid of an ion-getter pump and cryopanel cooled by liquid nitrogen, is described. Roughing and degassing is performed with an oil diffusion pump. Diffraction patterns and Auger spectra of (110) surface of GaAs are presented.
A Yu Mityagin et al, *Prib Tekh Eksper*, *No* 1, *Jan-Feb* 1972, 187–190 (*in Russian*).

33

264. Photoelectron and secondary emitters with negative electron affinity. (Czechoslovakia)
Properties of negative electron affinity photoelectron and secondary emitters are discussed. Importance of cleanliness of surfaces and ultra-high vacuum conditions at preparation of negative electron affinity emitters is shown.
M Jedlicka, *Slabopr Obzor*, **33** (1), *Jan* 1972, 44–49 (*in Czech*).

33

265. Inelastic collisions between slow alkali or alkaline earth ions and cadmium atoms. (USSR)
Detailed investigations of excitation processes occurring during collisions between Li^+, Na^+, K^+, Rb^+, Cs^+, Mg^+, Ca^+, Sr^+ and Ba^+ ions and cadmium atoms are carried out at energies ranging from the threshold values up to 1000 eV and the Cd vapour pressure of 1 to 9×10^{-3} torr. The effective cross sections for excitation of a number of lines emitted by the target atoms, incident ions and magnesium atoms are determined.
O B Shpenik et al, *Zh Eksper Teor Fiz*, **62** (3), *March* 1972, 879–891 (*in Russian*).

33

266. Scattering of atomic particles in collisions involving excitation of inner electron shells. (USSR)
Scattering of 10–180 keV atomic particles is investigated in the region of rapprochement when inner electron shells intersect. Pressure of target gas in the collision chamber was 4×10^{-4} torr during the experiments. A structure of the differential scattering cross sections is observed for collisions of N^+, Ne^+, Ar^+, Kr^+ and Xe^+ ions with atoms of Ne, Ar, Kr and Xe.
V V Afrosimov et al, *Zh Eksper Teor Fiz*, **62** (3), *March* 1972, 848–862 (*in Russian*).

33

267. Multiplet lines in mass spectra of niobium and its oxides. (USSR)
Using a mass spectrometer type MI-1305 with an ion source exit slit of 0.08 mm and an ion counter, it is possible to separate the lines of Nb, NbO and NbO_2 from impurity lines in multiplets when investigating the composition of the molecular beam from evaporation of Nb from a V-like filament in the ion source.
L S Palatnik et al, *Zavodsk Lab*, **38** (3), 1972, 299–302 (*in Russian*).

33

268. Measurement of energy and intensity of exoelectrons after deformation of aluminium at low temperatures. (Germany)
Results of measurement of the maximum energy of electrons and intensity of exoelectron emission in the temperature range 77 to 723°K after deformation of aluminium, are presented. Maximum exoelectron energy was measured in vacuum at 5×10^{-6} torr using the retarding field method. (USSR)
V S Kortov and I E Myasnikov, *Phys Stat Sol* (*a*), **9** (2), *Feb* 1972, K119–K122.

33

269. Experimental arrangement for investigation of single crystals with the aid of fast ions. (Germany)
A detailed description of a measuring equipment for channeling and blocking experiments is given. The technical data of the instrument are determined on the basis of planned experiments. The collimator, beam current measurement, crystal mounting and cryostat are detailed. Experimental results with a tungsten single crystal are presented.
G Haan et al, *Experim Techn Phys*, **20** (1), 1972, 67–80 (*in German*).

33

270. Intensity of the ion component in vapours of solids heated by electron beam and its utilization for mass-spectrometric analysis. (USSR)
Results of an experimental determination of the relationship between ionic and neutral components in vapours of solids locally heated by an high-energy electron beam are presented. Using a high-frequency mass analyzer, the ratio of the positive ion component to the neutral component is determined to be of the order of $1:10^4$ at a bombarding electron energy of 7 keV and specific beam power of 4.2×10^3 W/cm². In the evaporation of Al_2O_3 at a rate of 3×10^{-5} g/s this ratio is equal to $1:10^3$ at beam energy of 7 keV and specific power of 10^3 W/cm². Experiments with samples of different composition show that the mass spectra of the ionic component in the vapours are sufficiently intense and well reflect the qualitative elemental composition of the samples and give information on molecular composition. Analysis of the mass spectra of the ionic component show that ionization by electron impact and thermionic emission from the sample surface form two main causes of ion generation. The peaks of the gaseous background do not appear in the ionic component spectra up to pressures of 2×10^{-4} torr in the chamber.
G E Tsigelman, *Zh Tekh Fiz*, **42** (3), *March* 1972, 667–669 (*in Russian*).

33

271. High-temperature version of an x-ray diffractometer. (USSR)
A high-temperature version of an x-ray diffractometer is described. A built-in zeolite sorption pump provides vacuum of 10^{-5} torr in the device.
Yu A Kocherzhinskiy and V V Tsetkov, *Prib Tekh Eksper*, *No* 1, *Jan-Feb* 1972, 191–194 (*in Russian*).

33

272. Spectrometry of soft gamma- and x-radiation using semiconductor detectors. (USSR)
Technique of soft gamma- and x-radiation spectrometry using semiconductor detectors is considered. Construction of a vacuum chamber containing the cooled detector and evacuated to 10^{-5} to 10^{-6} torr by cryosorption or electric-discharge pump is described.
S A Baldin and L M Ioannesyants, *Prib Tekh Eksper*, *No* 1, *Jan-Feb* 1972, 7–30 (*in Russian*).

33

273. Fast neutron irradiation induced resistivity in metals. (Germany)
The residual electrical resistivity increase rate as a function of induced resistivity has been studied for fast neutron irradiated Al, Cu, Ag, Au, Pt, Fe, Ni, Co and Mo. An irradiation assembly with vacuum valve and epoxy seal of specimen lead wires located in a helium cryostat is described. (USA)
J A Horak and T H Blewitt, *Phys Stat Sol* (*a*), **9** (2), *Feb* 1972, 721–730.

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274. Electrode material for electrical vacuum apparatus. (USSR)
An improved type of material for the construction of anodes in electrical vacuum apparatus (e.g. receiving and amplifying valves) is described. The anodes are made of a multilayered material (produced by the cladding technique) consisting of an iron base coated on one side with a layer of titanium 40 μ thick and on the other with aluminium or nickel. The second layer increases the power dissipated (radiatively) by the anode.
I I Gutkin et al, *USSR Patent No* 316129, *appl* 17*th Dec* 1963, *publd* 27*th December* 1972.

37. METALLURGY, INORGANIC CHEMISTRY, ANALYTICAL CHEMISTRY

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275. Properties of liquid Al_2O_3. (USSR)
Density, surface tension, viscosity and electrical conductivity of liquid Al_2O_3 are studied at temperatures up to 2775°K in vacuum at 1×10^{-4} torr and argon ambient.
V P Elyutin et al, *Neorg Mater*, **8** (3), *March* 1972, 477–480 (*in Russian*).

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276. On the distribution of Fe and Co in InSb and GaSb during zone melting. (Germany)
The distribution of Fe and Co in InSb and GaSb during zone melting