oscillations of T_c, calculated from the experimental data, turned out to be on the order of 10^{-4} deg in agreement with the presented formula. The period of the oscillations R(H) corresponds to the quantum of the flux in the section of the cylinder. Notice should be taken of certain features of the effect.

1. The oscillation amplitude depends on the direction of change of the field - the amplitude is larger in decreasing fields.

2. The oscillations on the R(H) curve are observed up to its inflection point (maximum of the derivative).

3. Unlike the Parks-Little effect, the oscillation amplitude decreases with decreasing temperature.

4. According to calculations by I. O. Kulik (private communication), the oscillation period decreases with decreasing temperature in the appropriate quantitative ratio.

The preliminary experimental results presented here give grounds for assuming that we are dealing here with the effect predicted in [2]. More detailed quantitative investigations of the effect are now under way.

The authors are grateful to I. O. Kulik for supplying his calculations and for a discussion of the work.

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MOSSBAUER EFFECT ON IMPURITY NUCLEI IN METALLIC MATRICES

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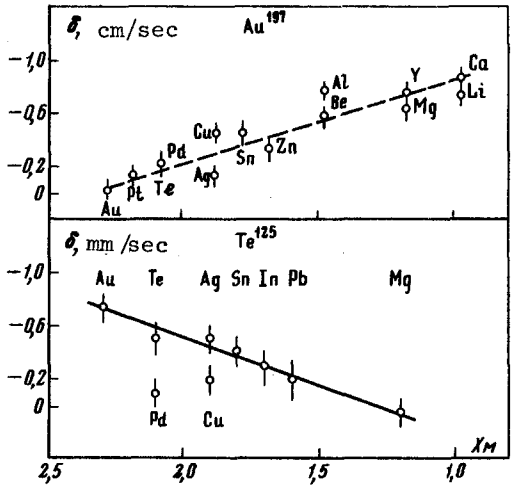
Until recently, the Mossbauer effect (ME) on impurity nuclei was investigated only in the widely used Mossbauer isotopes Fe^{57}, Sn^{119}, and Au^{197} [1-3].

Such investigations are usually intended to determine two quantities: the isomer shift δ of the resonance line and the ME probability f. An empirical connection is established between these parameters of the Mossbauer spectrum and certain properties of the solid, say the dependence of δ or f on the compressibility of the metallic matrix, the force constants of the coupling, the electronegativity, valence, concentration, etc.

The ME can be investigated by introducing into the matrix stable impurity isotopes or active γ-emitting isotopes. The second method is more convenient for the investigation of the ME on Te^{125} nuclei. The Mossbauer isotope Te^{125}, in analogy with Fe^{57} and Au^{197}, has another parent nucleus, since the Mossbauer level Te^{125} with energy 35.6 keV is obtained by decay of Sn^{125} into Sb^{125}. Therefore, the sources of the resonant γ quanta were made of tin enriched to 90% with Sn^{124}, irradiated by a neutron flux (the Te^{125} is produced in accordance with the scheme $Sn^{124}(n, \gamma)Sn^{125} \rightarrow Sb^{125} \rightarrow Te^{125}$), and introduced by fusing, in amounts 0.5 - 1 wt.%, into gold, silver, copper, palladium, tin, indium, lead, and magnesium of very

high purity. The samples were then rolled to a thickness 20 - 50 μ and annealed for several hours.

The Mossbauer spectra were plotted by an electrodynamic setup with linear velocity variation, the source and absorber being at liquid-nitrogen temperature, with the absorber in motion. The 35.6-keV γ quanta were registered with a scintillation counter with NaI(Tl) crystal 0.1 mm thick in accordance with the emission peak. The absorber was ZnTe enriched to 56%; the absorber thickness was 19 mg/cm^2.



Isomer shift for Au^{197} and Te^{125} vs. negativity of the metals.

We measured the line widths, the magnitude of the effect, and the isomer shifts. Using the methods of reducing the Mossbauer spectra [4,5], we determined also the probabilities of resonant emission of recoilless γ quanta. The Mossbauer-spectrum parameters are listed in the table.

It should be noted that, with allowance for the obtained values of f, the emission line width for the Sb^{125} sources in metallic matrices was found to be 2.5 mm/sec, corresponding to the natural line width ($\tau = 1.8 \times 10^{-9}$ sec, i.e., $\Gamma = 2.9 \times 10^{-7}$ eV or 2.44 mm/sec).

The figure shows the dependence of the isomer shifts for the Te^{125} nucleus on the electronegativity X of the metals, and a comparison with δ(X) for Au^{197} as given in [3].

Metal	Isomer shifts, mm/sec	Effect, %	Spectrum half-width, Γ_{exp}, mm/sec	f
Palladium	-0.11 ± 0.1	6.9 ± 0.3	8.1 ± 0.2	0.47 ± 0.12
Silver	-0.54 ± 0.1	4.4 ± 0.3	8.2 ± 0.2	0.28 ± 0.07
Gold	-0.76 ± 0.1	7.0 ± 0.3	8.9 ± 0.2	0.29 ± 0.07
Copper	-0.22 ± 0.1	9.5 ± 0.3	8.2 ± 0.2	0.60 ± 0.15
Tin	-0.44 ± 0.1	4.4 ± 0.3	8.2 ± 0.2	0.25 ± 0.06
Magnesium	0.00 ± 0.1	4.5 ± 0.3	8.4 ± 0.2	0.12 ± 0.03
Lead	-0.22 ± 0.2	≃ 1	1)	< 0.1
Indium	-0.30 ± 0.2	≃ 1	1)	< 0.1

1) The line width was not determined because of the small statistics

We call attention to the difference in the slopes of $\delta(X)$: on going from gold to magnesium, the isomer shift increases for Au^{197} but decreases for Te^{125}. This behavior of $\delta(X)$ for Te^{125} can be explained by starting from the equality of the sign of the change of the charge radius $\Delta R/R$ in Au^{197} and Te^{125}. Whereas in the case of Au^{197} the increase of the isomer shift is connected with the increase of the s-electrons at the nucleus (filling of the 6s shell of gold), the decrease of the isomer shift of Te^{125} should accordingly lead to a decrease of the density of the s-electrons at the nucleus.

Indeed, the valence electrons from the less electronegative metals go over to the Te, fill its p-shell, and decrease the s-electron density at the Te^{125} nucleus by screening. This conclusion agrees with our data on the isomer shifts for halogenide complexes of tellurium [6].

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STRUCTURE OF LASER SPARK IMAGE

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Korobkin et al. [1] observed a beadlike structure of the image of a laser spark in air, when photographed in the light of the scattered laser radiation, and advanced the hypothesis that the individual beads can be connected with successive breakdown at the corresponding points; they also made certain assumptions concerning the possible causes of multiple breakdown of this type.

We observed new singularities and the absence of a beadlike structure; this allows us to make different assumptions concerning the nature of this structure. In particular, we have observed that in a number of inert gases there is no beadlike structure.

We used a ruby laser with energy up to 2 J and power up to 100 MW, Q-switched by a rotating prism. There was no mode selection. The electric field vector $\vec{E}$ in the laser beam was oriented vertically. Focusing was by means of lenses with focal lengths from 2 to 20 cm. The spark was photographed integrally in time through a filter that cut off the red light of the laser. The axis of the camera passed through the focus of the length and was located in a plane perpendicular to the laser-beam axis. We note that photographs made simultaneously from two diametrally opposite photography points (Figs. a and b; the camera axis is perpendicular to $\vec{E}$) do not coincide with respect to the location of the beads, their intensity, and their size, and sometimes also with respect to the prongs of the fork-like structures