s is a consequence of their pressure
ce bomb technique pressures are only
hich prevents the simultaneously grown
. It is worth noting that these authors
p) curve near the yield strength.

-Zirconium

e with three atoms per unit cell[15,16].
imilarity it is supposed that its formation
e β-Zr (bcc) is diffusionless. It is not yet
n the α phase, too[17]. The transition from
etween 50 and 60 kbar at room temper-
which increases with pressure in α-Zr,
at the transition by about 18%, but in
such drop is observed at all[17]. Of the
ω-Zr only T_c in the metastable state
ured before[18].

essure dependence of T_c of the ω phase
influence on the low pressure behaviour,
n pressure is comparable to the maximum
cell in the tongs, most of the attempts
hnique failed because the cells fractured.
experiments, in which the pressure came
. In none of them any drop in resist-
oth samples showed a strongly reduced
as an enhanced $T_c(p)$, lying distinctly
urve for the α phase. After release of
ling at room temperature $T_c(0)$ of one
other sample was damaged on removal

e the α to ω transition, the opposed
sponding clamp apparatus did not fit
d thus only be cooled in a He^4 dewar.
ase transition could not be determined.
ailable experimental equipment leaves
sure and temperature, just in the inter-

K/bar for unannealed and $dT_c/dp = 15 \times 10^{-6}$

963).
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esting transition region. The observed dependence of the electrical resistance on the pressure was as follows: In a first compression run R increased until the transition was reached, whereupon it decreased. This drop, however, was in none of the cases as great as could be expected. With further increase of pressure R decreased slightly. Any sample, once compressed above 55 kbar, showed a monotonic decrease of R from $p=0$ up to the highest attainable pressures in each following experiment and a corresponding increase of R upon lowering of pressure. This behaviour corroborates the observation, that the transformation from ω-Zr to α-Zr is strongly retarded.

The experimental points for $T_c(p)$ of the ω phase can be approximated by a straight line, determined by a least squares fit, with the slope $dT_c/dp = 7.7 \times 10^{-6}$ K/bar. The broad superconducting transitions as well as a small residual resistance ratio of about 8 indicate a highly disturbed state of the samples, but annealing at room temperature is of no influence on T_c. If the straight line is extrapolated to zero pressure, $T_c(0) = 0.72$ K is found. Although the agreement with the value gained by the piston-cylinder technique* is good, it should not be overestimated because of the uncertainties of such an extrapolation. It should be noted that our value disagrees with that of Tittmann *et al.*[18] for metastable ω-Zr ($T_c(0) = 0.65$ K).

Measurements with zirconium from another stock have been performed. This sample showed an unusually high $T_c(0) = 0.8$ K, but a dT_c/dp comparable with that of the Koch-Light Zr in the pressure range below 50 kbar. On the other hand, for ω-Zr $dT_c/dp = 11.3 \times 10^{-6}$ K/bar, which is distinctly greater than the corresponding value for Koch-Light material. We have no explanation for this at present.

Induced by the high $T_c(0)$-values, efforts were made to anneal cold rolled and trimmed samples in an ultrahigh vacuum of 10^{-10} Torr at about 1070 K, a few degrees below the transition temperature into the cubic, high temperature β phase**. If the high $T_c(0)$ were caused by lattice defects, this procedure should result in a lowering of these values. This was the case ($T_c(0) = 0.5$ K for MRC-Zr after heat treatment), but at the same time the residual resistance ratio was as low as 4, so that a contamination of the samples had to be supposed. This can be understood by the well known gettering properties of zirconium. The slope dT_c/dp after heat treatment was about twice the previous value of 3.5×10^{-6} K/bar. The lowering of T_c and raise of dT_c/dp agrees with the behaviour observed by Brandt and Ginzburg[5] after heat treatment and might suggest that their annealed samples had also been contaminated. Unfortunately, these authors do not report data of their residual resistance ratio.

The correct value of $T_c(0)$ for Zr is as yet an open question, even though the value 0.55 K is commonly accepted. T_c is influenced by such phenomena as im-

* It cannot be stated unequivocally that the sample referred to had totally transformed into ω.

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