

CONCLUSIONS

1. In prolonged low-temperature creep of lithium the curves have the three stages characteristic of normal creep, i.e., instantaneous deformation, transitory stage and steady stage of flow.

2. At room temperature* and low stresses (0.1 kg/mm²) the creep curves of single-phase specimens do not follow a logarithmic law. At low temperatures (77°K), in lithium as in a number of other metals [2], the logarithmic law of creep holds right up to the stress levels at which the polymorphous transition is either totally absent or very weak. Beginning from a certain stress (0.5-0.6 kg/mm²), sufficient for the b.c.c.-to-f.c.c. transition, the logarithmic law of the transitory stage of creep is not satisfied. The same thing is found in specimens after prior deformation at 77°K, even under conditions of creep with low stresses (0.3 kg/mm²).

3. The main b.c.c.-to-f.c.c. transition takes place in the period of instantaneous deformation in creep and follows martensitic kinetics.

4. The low-temperature creep curves of lithium specimens have a steady stage of creep. Therefore, even at liquid nitrogen temperature, recovery as well as strengthening processes occur in lithium specimens under slow deformation. These processes seem to be accelerated by the development of martensitic bands at the steady-state creep stage.

5. By measuring the resistivity at 77°K we have found a maximum for the initial specimens and a monotonic drop in resistivity for specimens predeformed at 77°K. This difference in the resistivity is due to the different ratios of the processes of strengthening and recovery for the two different batches of specimens.

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* For lithium 300°K is a high temperature.