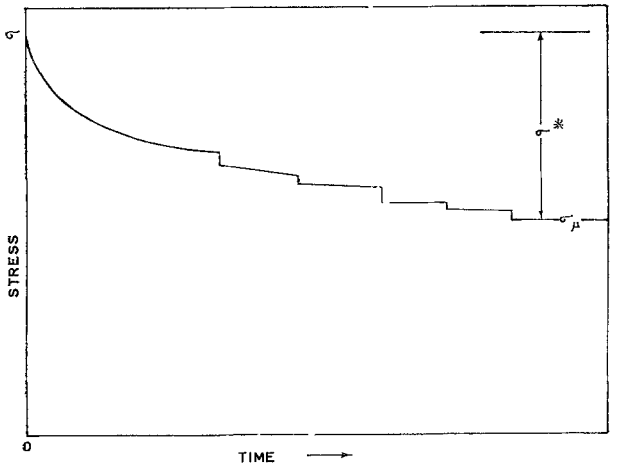

Figure 3 Schematic figure showing technique used for determining σ^*.

relaxation technique will give lower apparent values of σ^* at very low temperatures. This is because what is determined as σ_μ is the stress at which plastic strain rate is so slow that the resultant stress-relaxation is too slight to be detected on the Instron chart. It is estimated that this strain rate will be of the order of 10^{-11}/sec. While at sufficiently high temperatures, the thermal component of stress for this strain rate will be negligible, the error will increase as we go to lower and lower temperatures. In the case of niobium, as results indicate, the method is found to be successful down to as low a temperature as 197° K.

In spite of these limitations at very low temperatures, the method is helpful in evaluating σ^* and σ_μ fairly accurately at not too low temperatures, and can be applied in investigations on metastable structures, where the conventional method fails. σ^* at lower temperatures could then be evaluated by extrapolation to lower temperatures of σ_μ values determined at high temperatures, as in the conventional method. This technique has been successfully employed for studying the deformation behaviour of α-zirconium containing quenched-in hydrogen. The results of this study are being published elsewhere [9].

Acknowledgements

The author is grateful to Dr M. K. Asundi, Head, Physical Metallurgy Section, for his keen interest in this work. He is specially indebted to Dr V. S. Arunachalam for helpful discussions and suggestions.

References

1. H. CONRAD, NPL symposium "The Relation Between the Structure and Mechanical Properties of Metals" (HMSO, 1963) p. 476.
2. *Idem, J. Metals (AIME)* **16** (1964) 582.
3. A. SEEGER in "Dislocations and Mechanical Properties of Crystals", edited by J. Fisher *et al* (Wiley, New York, 1957) p. 243.
4. F. GUIU and P. L. PRATT, *Phys. Stat. Solidi.* **6** (1964) 111.
5. G. A. SARGENT, *Acta Met.* **13** (1965) 663.
6. F. W. NOBLE and D. HULL, *ibid* **12** (1964) 1089.
7. S. M. OHR *et al*, USAEC Report ORNL-3878 (1966) p. 16.
8. G. A. STONE and H. CONRAD, *Acta Met.* **12** (1964) 1125.
9. P. RODRIGUEZ and V. S. ARUNACHALAM, to be submitted to *J. Nucl. Mat.*

7 September 1967

P. RODRIGUEZ
Metallurgy Division
Bhaba Atomic Research Centre
Bombay 1, India

Book Review

Tables of X-ray Mass Attenuation Coefficients

(In German, French, and English)

R. Theisen, D. Vollath

Pp 40 (Verlag Stahleisen, Düsseldorf, 1967) DM 22

This volume gives the determination, by the authors, of the best available data on the values of the mass attenuation coefficients (μ/ρ) for most X-ray lines by most elements. The most reliable values in the literature have been used and interpolated using the formula

$$\mu/\rho = C\,\lambda^\alpha\,Z^B$$

where λ is the wavelength of the radiation and Z the atomic number of the absorbing element. The constants C, α, and B were determined by use of a computer programme.

These data were tabulated with a view to the needs of analysts concerned with X-ray fluorescence, microprobe, and radiographic analyses.

R. D. DOHERTY