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Positron Annihilation in Copper

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Preliminary analysis indicates that the... with an electron flux raised to several orders of magnitude. The time dependent dislocation pinning rate was measured for a span of two orders of magnitude in point defect production rates at fixed... in the power of 0.806.

**F 6 Amplitude Dependence of Dislocation Damping in High Purity Copper After Quenching and Electron Irradiation.** J.W. Keram and R.M. Simpson, Physics Dept., Wright State University. — Dislocation—point defect interactions in high purity copper were studied by measuring Young's modulus and the logarithmic decrement near room temperature. Vacancies were introduced by quenching from 500°C at an initial quench rate of 3000°C per second. Interstitials and vacancies were created by irradiation with 1 MeV electrons. Of primary interest were strain amplitude dependent effects; in particular, the determination of the existence or non-existence of an initial increase in damping after quenching ("peaking effect"). Pursuant to this end, it was necessary to measure the modulus and the damping at strain amplitudes varying over several orders of magnitude.

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**F 7 Positron Annihilation in Copper.**  K. White, W.R. Rickles, and T.W. Listerman, Wright State University. — An angular correlation apparatus for the detection of the two coincident γ rays emitted during positron-electron annihilation in materials has been constructed. The apparatus was used to examine annihilation in both annealed and unannealed copper samples and the analyzed results were found to agree with published results.

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**F 8 Studies of Polarized Absorption Spectra of Nd³⁺ in Yttrium Orthovanadate at 77°K.** R. Fadell, L.P. Yaney, and J.W. Keram, University of Dayton. The upper Stark levels of the ground state Nd³⁺:YVO₄ through the 2F₁/₂ to the 2F₃/₂ states and their irreducible representation labels were determined. The studies covering 340 nm to 892 nm were recorded using a Jarrell-Ash 3.4 m high-resolution spectrophotograph. The spectra were analyzed using published "free-ion" energy levels and the splittings and irreducible representation labels of the ground state Nd³⁺:YVO₄ given by Yaney and DeShazer. We established 14 Stark levels and 75 irreducible representation labels in addition to those previously published. Vacuum wavelength and the peak absorption coefficients of the observed transitions were also obtained.

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