DISCUSSION

J. T. Stanley[1]—This paper is an interesting and timely contribution to our understanding of irradiation effects in steel. However, there are two points concerning interpretation of the data that need to be discussed.

1. It should be noted that separation of the internal friction data shown in Figs. 1 and 2 to determine relative magnitudes of the three different peaks is not without an element of uncertainty. An alternate analysis would assign a value of at least 15.5×10^{-4} to peak PI, the normal Snoek peak, for specimen A immediately following irradiation instead of the value of zero presented by the authors in Fig. 3. The significance of this alternative interpretation of the data is that it presents evidence for breaking up of precipitate particles by neutron irradiation.

2. Consideration of the magnitude of peak PIII makes it unlikely that this peak could be due to a nitrogen vacancy complex. The magnitude of peak PIII in the present case would require a relaxation strength per nitrogen-vacancy complex about 100 times that of the carbon-vacancy complex postulated by Wagenblast and Swartz. It seems unlikely that the nitrogen vacancy could have such a large relaxation strength but still have about the same motion energy as the carbon vacancy complex.

N. Igata (authors' closure)—2. The peak height of PIII was taken as 65×10^{-4} by taking into account of the slope of the background, which was estimated from the shape of peak PII. This value is about 50 times larger than the value of Wagenblast and Swarts. This high peak value shows that the resolution of metastable nitride or thin AlN precipitates is much greater than the resolution of the metastable carbides in Fe-0.2C shown by Wagenblast and Swarts. It does not show, however, that the relaxation strength per unit defect in the case of the nitrogen vacancy is 50 times higher than in the case of carbon vacancy.

1. Since the temperature was measured by a thermocouple directly attached to the specimen, the accuracy of the temperature measurement would be high. Thus, while the peak can be interpreted to be other than the normal Snoek peak, it also provides evidence for the break up of precipitate particles by neutron irradiation.

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A. L. Bement[2]—Have you observed the occurrence of radiation anneal hardening in the specimens exhibiting a PIII peak resulting from the resolution of nitrogen? If so, did the hardening decay with room temperature aging?

N. Igata (authors' closure)—Although we did not measure the hardening as a function of aging time at room temperature, the possibility of a change in hardening corresponding to structural changes must exist.

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