ACKNOWLEDGMENTS

We would like to acknowledge technical advice and comments from Dr. G. K. Wertheim concerning the particular problems of measurements, analysis, and discussion of critical point phenomena. We are greatly indebted to Dr. E. Helfand for theoretical discussions on the comparison of the results with critical point theory, and to Dr. M. E. Lines for helpful discussions on magnetostrictive first order transitions. We performed the thermal expansion measurements using equipment belonging to Dr. E. Fawcett, and we would like to thank him both for making the apparatus available and for helpful comments on the analysis of the data. The discussion reflects comments and suggestions by Dr. M. Blume.

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DISCUSSION

1. *Intervention de M. Kirchmayr :*

How closely does the internal field follow the macroscopic measurable magnetization ?

Réponse de M. Cohen :

Because of the extremely high magnetic anisotropy of Eu metal, bulk magnetization measurements are not a reasonable measurement of the ion moment. The hf field does follow the ion moment as measured by neutron diffraction.

2. *Intervention de M. Jones :*

Do you mean exchange-striction instead of magneto-striction for the lattice distortion at the transition temperature ?

Réponse de M. Cohen :

The interionic magnetic coupling is predominantly due to exchange via the conduction electron polarization. But we would expect the deformation to result from the total magnetic interaction not just the exchange part.

3. *Intervention de M. Datta :*

In your introduction, you mentionned that in 15 minutes on the basis of Mössbauer spectra, you can distinguish the valence state of Eu (Eu^{2+} or Eu^{3+}). As luminescent chemists, we can say it in 3 seconds. However, I would like to have your comments on the usability of Mössbauer effects in the quantitative analysis of Eu^{2+} and Eu^{3+} when present in the same matrix.

Réponse de M. Cohen :

You can easily do such determinations to a *precision* of a few percent. The *absolute accuracy,* however, is subject to the restriction that the strength (recoil-free-fraction) of the Mössbauer resonance may be different for the two sites, and this can introduce deviations of perhaps 20-30 % in such determinations.

Commentaire de M. Teaney :

The usual magnetic measurements in uniform field are not applicable because Eu is not a simple ferromagnet so that the limit as $H \to 0$ is not relevant. No transition exists for a simple ferromagnet when $H \neq 0$.

Commentaire de M. Taylor :

Magnetization measurements (at $Q \neq 0$) might be possible using neutrons.

Réponse de M. Teaney au commentaire de M. Taylor :

They might be possible but they are not very probable.