NOTE ON MAGNETIC RESONANCE OF A UCo_x SYSTEM[1]

К ВОПРОСУ О МАГНИТНОМ РЕЗОНАНСЕ В СИСТЕМЕ UCo_x

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The stoichiometric dependence of the microwave resonance effect was studied for x from 1.906 to 2.036. Measurements at a frequency $f = 10.93$ GHz were carried out at room and liquid nitrogen temperatures. The stoichiometric dependence of the measured linewidth exhibits a minimum in the range of x between 1.96 and 2.00.

This communication is a continuation of papers [1] and [2] dealing with the effect of the parameter x on the electrical resistance and a.c. susceptibility of the system. The present contribution deals with the behaviour of the microwave resonant effect in UCo_x in the interval if the stoichiometric parameter $x \in \langle 1.905; 2.036 \rangle$. The purpose of experiments carried out was to obtain further experimental data on

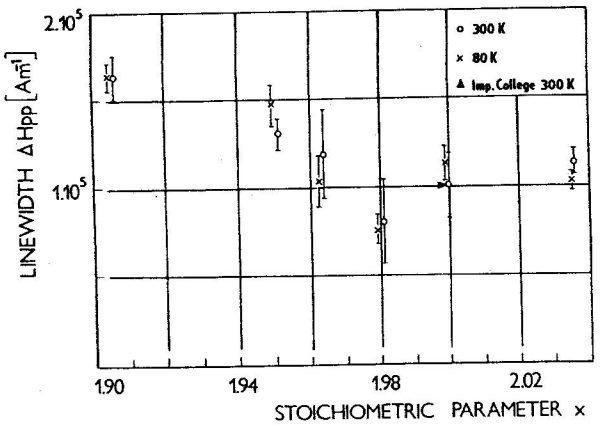

Fig. 1.

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the existing knowledge of the stoichiometric dependence of UCo_x particularly near $x = 2$. The measured quantities were: the resonant field H_r, the width of the resonant curve ΔH_{pp} (Fig. 1) and the magnitude of the signal of the microwave resonance. The measurements have been carried out at a fixed frequency of 10.93 GHz and at room and liquid nitrogen temperatures, respectively. The powder-like samples were obtained in the mechanical way from bulk ones prepared by means of the levitation induction melting. The content of other phases (besides the Laves phase) did not exceed 7 % throughout the whole given range of x. The paramagnetic behaviour of all samples was verified by susceptibility measurements at both temperatures.

The value of the resonant field H_r in the whole studied range of stoichiometry and for both temperatures is $(104 \pm 24) \times 10^3$ Am^{-1} (i.e. $(13 \pm 3) \times 10^2$ Oe). The stoichiometric dependence ΔH_{pp} exhibits a minimum placed within the interval of $x \in \langle 1.96; 2.00 \rangle$ its shape being the same for both temperatures within the limits given by the accuracy of the measurement. The minimum value measured is $(80 \pm 16) \times 10^3$ Am^{-1} (i. e $(10 \pm 2) \times 10^2$ Oe). The magnitude of the signal increased two times after the sample has been cooled.

Owing to the fact that this has been the first measurement of this kind carried out in our laboratory, the authors do not discuss the effect observed as well as the measured dependences in all details. Anyway, it can be stated that the values of H_r and ΔH_{pp} at room temperature are in good agreement with values from an arc-melted sample prepared at the Imperial College. The measured stoichiometric dependence of ΔH_{pp} has a similar shape as the dependence of maximum values of the a.c. susceptibility in [2]. This result alone implies a strong effect of the parameter x on the phenomena of the resonant absorption and relaxation.

REFERENCES

[1] Hřebík, J.: *PhD thesis,* Faculty of Mathematics and Physics, Charles University, Prague 1977.

[2] Zentko, A. Hřebík, J., Šternberk, J., Turán, J.: *Internat. Symposium on the Physics of Actinides and Related 4f Materials,* Zürich 1980.

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