# A NOTE ON RICHTER-TYPE MAGNETIC RELAXATION IN FERRITES

К вопросу о магнитной релаксации типа Рихтера у ферритов

Magnetic relaxation of the Richter type characterized by the relaxation time

$$\tau = \tau_\infty e^{\varepsilon/kT} \tag{1}$$

has recently been studied by Kienlin with nickel-zinc ferrite [1] and by us for non-stoichiometric manganese ferrites [2]. In the first case the samples had the same ratio of cations but they had different values of the activation energy $\varepsilon$ in relation (1) as a result of the different firing temperature. In our paper the activation energy varied chiefly as a result of the different ratio of the ions of Fe and Mn and secondly also depended on

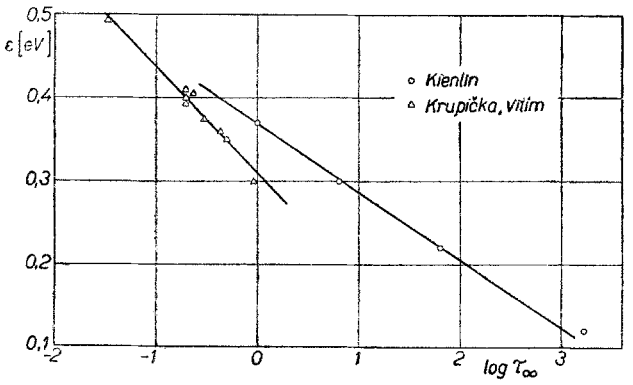


Fig. 1.

the content of oxygen in the samples. In both papers it was found that the constant $\tau_\infty$ is connected with the value of the activation energy $\varepsilon$ in that $\tau_\infty$ decreases with increasing $\varepsilon$.

The aim of this note is to point out that for a given type of samples this connection can be expressed by a simple linear relation

$$\varepsilon = A \log \tau_\infty + B \tag{2}$$

where the constants $A$ and $B$ are characteristic for the given type of material and given relaxation diffusion mechanism. These dependences are plotted in Fig. 1 for Kienlin's and our measurements.

Relation (2) is a complete analogy of the Meyer Neldel law for the electric conductivity of semi-conductors [3]; it suffices merely to replace $\tau_\infty$ by the constant $\sigma_0$ from the exponential law $\sigma = \sigma_0 e^{-\varepsilon/kT}$. Here it should be noted that some time ago Brož [4] by measuring the electric conductivity of manganese zinc ferrite with an excess of Fe ascertained the validity of this law for the case of changes in the activation energy caused by a different electric voltage on the sample.

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Svatopluk Krupička
*Institute of Technical Physics, Czechosl. Acad. Sci., Prague*

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