oscillator strength due to stress-induced changes of the occupation probability of the defect ion in a single off-center well. This effect is only observable if uniaxial stress lifts the equivalency of the different potential wells i.e. if the minimum energy E_n in equ. [2] depends on the position of the n-th well relative to the stress axis.

In KCl:Cu^+ we observe a change of the UV-bands only under [011]-stress, but there is no change due to tetragonal distortions ([001]-stress), see Fig.1. This means that eight off-center wells are arranged on the corners of a cube in the [111] directions which remain equivalent under tetragonal distortions of even parity. Moreover it follows that the two stress effects on the band intensitiy mentioned above could be neglected for KCl:Cu^+. Under [011]-stress the position degeneracy of the eight wells is lifted and we observe a change of the band intensity due to transitions between two inequivalent sets of potential wells, which is proportional to the difference of the occupation probability δW.

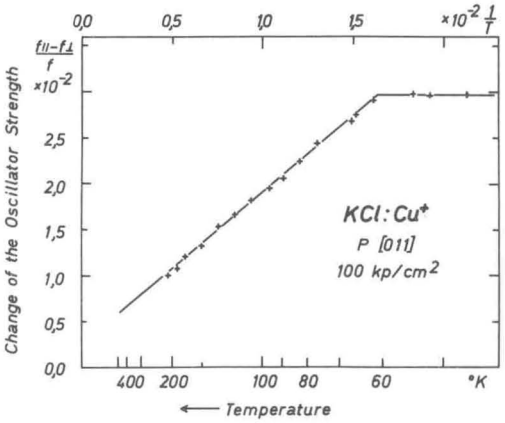

Fig.2. Stress effect of the oscillator strength of the band at 4.7 eV in KCl:Cu^+ versus temperature.

$$\delta W \approx \frac{\Delta}{8kT}\left\{e^{-\frac{t}{\tau}} - 1\right\} \qquad \text{for } \frac{\Delta}{2} \ll kT \qquad [3]$$

Δ is the energy difference of the two sets and τ the relaxation time for establishing thermal equilibrium.

$$\tau = \frac{\pi}{2\omega} e^{\frac{E_o}{kT}} \qquad [4]$$

E_o is the minimum height of the wall between adjoining potential wells. At low temperatures τ becomes very long and the initial distribution freezes in.

Fig.2 shows the stress change of the oscillator strength of the UV-band at 4.7 eV in KCl:Cu^+ versus 1/T. The effect increases proportional to 1/T, but becomes a constant below the freezing point at 60°K. Near 60°K τ is of the magnitude of about a minute see Fig.3 and we obtain the frequency ω and the wall height E_o from its measurement:

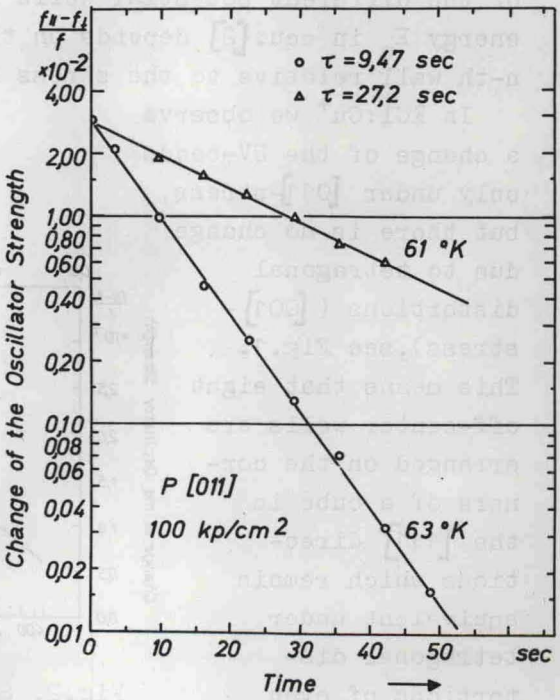

Fig.3. Time dependence of $(f_{\parallel} - f_{\perp})/f$ of the band at 4.7 eV in KCl:Cu^+ after having removed the stress.

$$E_o\ (KCl:Cu^+) = 1.6 \pm 0.1\ eV \triangleq 1850 \pm 100^{\circ}K$$

$$\omega \triangleq 4\ cm^{-1}\ ;\quad 0.4 \leq \omega \leq 40\ cm^{-1} \qquad [5]$$