calculations. Comparing the single-particle energy of the last occupied state, 1j in $^{298}_{114}X$ of our calculations, with those of ROST [11], VAUTHERIN and BRINK [12], and DUBNA [13] for $1\,j_{15/2}$ state which are 9.0, 9.0, and 10.6 MeV respectively, there seems to be a good agreement. There seems to be a partial magic number at the neutron number 170 from the level diagram of MOSEL and GREINER [14]. The single-particle energies for all states of neutrons in $^{284}_{114}X_{170}$ have also been presented.

From crude estimation based on the single-particle energies of last bond particles the superheavy nucleus $^{284}_{114}X_{110}$ seems to be stable against α-decay (or with long half-life time) which is consistent with Meldner's $^{284}_{114}X_{110}$. Other calculations also support the long half-life time except that of BRINK [12] which has very short life-time for α-decay ($\sim 10^{-14}$ years).

1 M. A. K. LODHI, Phys. Rev. **182**, 1061 [1969] and references therein.
2 W. E. FRAHN and R. H. LEMMER,, Nuovo Cim. **5**, 1564 [1957]; **6**, 664 [1957].
3 A. M. GREEN, Phys. Letters **1**, 136 [1962]; **3**, 60 [1962]; Nucl. Phys. **33**, 218 [1962].
4 M. RAZAVY et al., Phys. Rev. **125**, 269 [1962].
5 A. SCOTTI and D. Y. WONG,, Phys. Rev. **138**, B 145 [1965].
6 P. ROEPER, Z. Phys. **195**, 316 [1966].
7 H. MELDNER, Phys. Rev. **178**, 1815 [1969].
8 H. MELDNER and G. SUESSMANN, Phys. Letters **6**, 353 [1963]; Z. Naturforsch. **20 a**, 1217 [1965].
9 J. VOGELER, Nucl. Phys. A **133**, 289 [1969].
10 Noted in A. BOHR and B. R. MOTTELSON, Nuclear Structure, Vol. 1, W. A. Benjamin, Inc., New York 1969, p. 325.
11 E. ROST, Phys. Letters **26 B**, 184 [1968].
12 D. VAUNTHERIN and D. M. BRINK, ,Phys. Letters **32 B**, 149 [1970].
13 A. A. SOBICZEWSKI, F. A. GAREEV, ,and B. N. KALINKIN, Phys. Letters **22**, 500 [1966].
14 U. MOSEL and W. GREINER, Z. Physik **222**, 261 [1969].

Thermoluminescence of Deformed NaCl:Tl

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Glow curves were recorded for annealed and quenched NaCl:Tl samples, compressed to tablets, after ultraviolet irradiation at room temperature. A marked difference in the shape of the glow curve for the first and second heating run has been observed. It is suggested that vacancy clusters and dislocation dipoles produced during deformation influence the thermoluminescence process of the deformed specimen.

The effect of quenching from different temperatures on the thermoluminescent behaviour of NaCl:Tl has been reported earlier [1]. It has been observed that, unlike other heat treated specimens, only the specimens annealed and quenched from a temperature close to the melting point exhibit a single, well developed peak at 390 °K. The purpose of this paper is to examine the effect of deformation on the thermoluminescence of thermally pretreated NaCl:Tl specimens. Specimens in the form of powder were prepared by crystallization from solution with varying Tl concentration. Spectroscopically pure sodium chloride supplied by Johnson, Matthey & Co., was used as host material. The powder specimens so obtainend were annealed and quenched from different temperatures and subsequently compressed to tablets in a stainless steel press. More or less similar results were obtained for specimens with different Tl content subjected to the above pretreatment. The results obtained in the case of the specimen with 0.03 mole percent Tl, quenched from 750 °C and then pressed to a tablet, shall be discussed. Thermal glow curves were recorded as described previously [2] after warming the specimen at the rate of 10°/min.

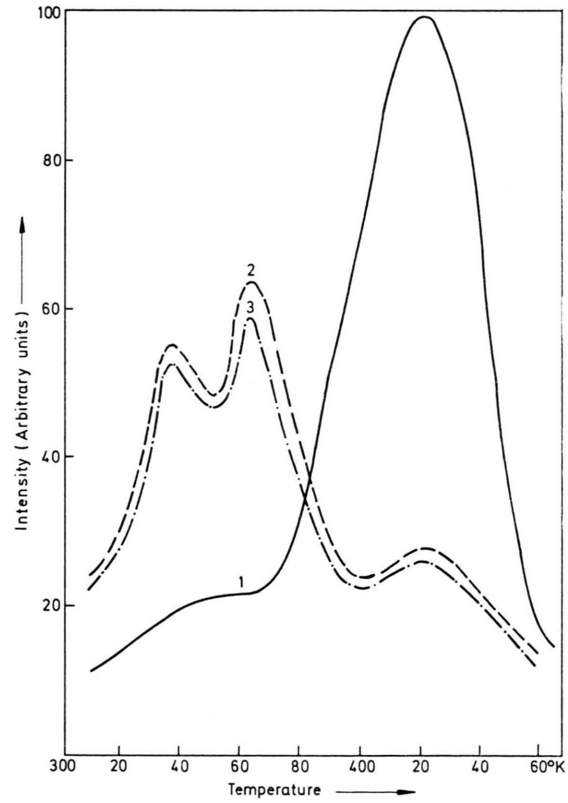

Fig. 1. Thermal glow curves for NaCl:Tl specimen quenched and then compressed to tablet. Curves 1, 2 and 3 represent the first, second and third thermal cycle respectively.

Figure 1, curve 1, which corresponds to the first thermal cycle, exhibits a pronounced glow peak at 420 °K

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and a subsidiary peak around 340 °K. In the second heating run (curve 2) the 420 °K peak is considerably suppressed and two well defined peaks around 340 and 360 °K appear. The peak positions on the temperature scale were found to remain unchanged in the subsequent heating runs (curve 3).

It is now generally accepted that the plastic deformation of alkali halide crystals gives rise to dislocation debris in the form of vacancy clusters and dislocation dipoles [3–5]. It is therefore presumed that the centre responsible for 420 °K glow peak is a complex formed by the association of a Tl ion with a single vacancy or an aggregate of vacancies, the complex being situated in the dislocation region. At the end of the first heatinig run, when the specimen is heated to around 500 °K, a change in the distribution of the dislocations would take place to lower the strain energy of the microcrystals. Such a redistribution may involve both annihilation of dislocation dipoles and their alignment into low angle boundaries. To brinig about the rearrangement, both forms of motion (climb and slip) of edge dislocations are necessary. Since the dislocation climb depends on the movement of vacancies (an activated process), the rate of rearrangement increases rapidly with temperature. Thus by heating the specimen to around 500 °K, the dislocation content of the specimen will be reduced which in turn destroys the 420 °K centres.

The transformation of the 420 °K peak to 340 and 360 °K peaks, obvious in the second thermal cycle, suggests some kind of generic relationship between them. In other words some of the Tl^+ ions and the vacancy components of the 420 °K centres are used up in the formation of 340 and 360 °K centres. This is in accord with the nature of the centre proposed earlier [6] for the 340 °K glow peak in NaCl:Tl.

[1] R. V. Joshi and T. R. Joshi, Japan J. Appl. Phys. **10**, 1291 [1971].
[2] R. V. Joshi, Proc. Phys. Soc. London **79**, 497 [1962].
[3] R. W. Davidge and P. L. Pratt, Phys. Stat. Sol. **3**, 665 [1963].
[4] W. A. Sibley, Phys. Rev. **133**, 1176 [1964].
[5] R. Chang, Phys. Rev. A **138**, 839 [1965].
[6] R. V. Joshi and T. R. Joshi, J. Luminescence **3**, 389 [1971].

BERICHTIGUNGEN

Zu M. Dakkouri und H. Oberhammer, Molekülstrukturbestimmung von Trimethylazidosilan mittels der Elektronenbeugung an Gasen, Z. Naturforsch. **27 a**, 1331 [1972].

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24. Zeile: ... $E_r > 5 \cdot 10^5$ V/cm.

Zu Abb. 8: — —, Nickeldraht.

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