

AIM: (a) to understand the initial rise and fractional glow techniques for the calculation of activation energy (E) and frequency factor (s) and (b) to calculate the E, s parameters for all peaks of TLD 100 or natural salt.

Materials: Lithium fluoride (TLD 100, LiF:Mg,Ti) or natural salt

PROTOCOL:

Step 1. Irradiation (0.5 Gy for synthetic materials, 15 Gy for natural materials)

Step 2. TL measurement (350 °C for synthetic materials, 500 °C for natural materials, HR=1°C/s)

Step 3. Identify each glow peak, the T_{mi} and I_{mi} of each one, as well as the temperature at which I=I_{mi} /8

Step 4. Irradiation (1 Gy for synthetic materials, 50 Gy for natural materials)

Step 5. TL measurement (50 °C, HR=1°C/s)

Step 6. TL measurement (55 °C, HR=1°C/s)

Step 7. TL measurement (60 °C, HR=1°C/s)

Repeat step 7 for increasing temperatures in steps of 5°C/s up to 350 °C for synthetic materials and 500 °C for natural materials.

Analysis:

1. Calculate the E, s according to the initial rise technique
2. Plot E vs T for fractional glow technique, find how many peaks and activation energies.

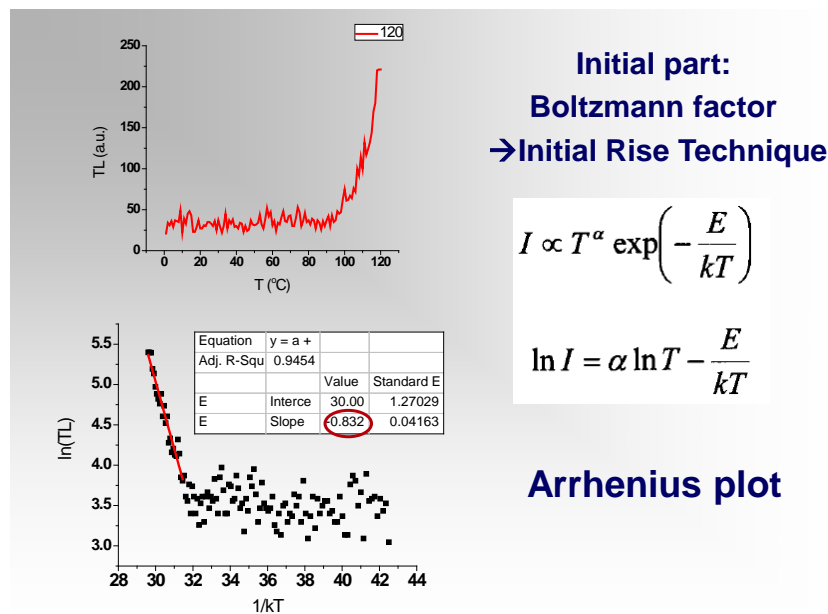


Fig. 1. Analysis for the initial rise technique.

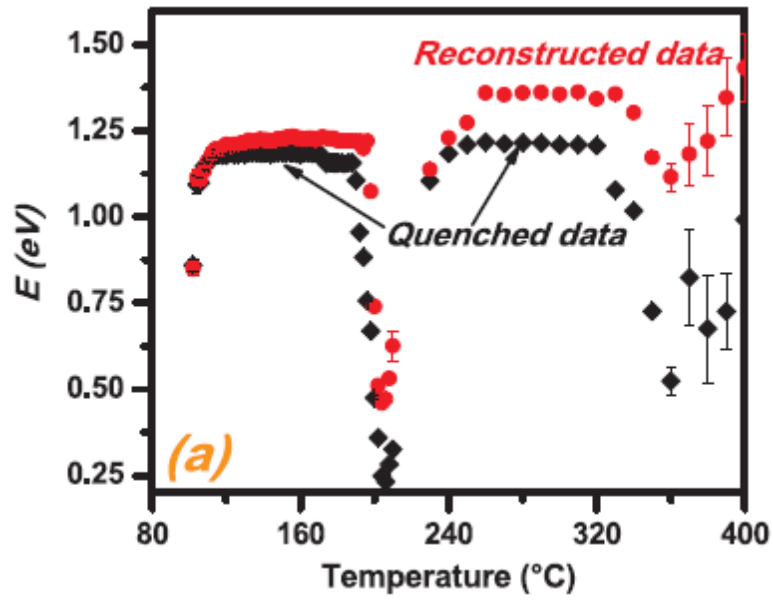


Fig. 2. Plot of E vs T for the fractional glow technique for BeO. 2 different traps could be identified.