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The electrical conduction mechanisms and thermoelectric power of SnSe single crystals



of

M. M. NASSARY

Physics Department, Faculty of Science, South Valley University, Qena-EGYPT

e-mail: Nassary\_99@yahoo.com

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 [Keywords](#)  
 [Authors](#)



[phys@tubitak.gov.tr](mailto:phys@tubitak.gov.tr)

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**Abstract:** Single crystals of SnSe were prepared in our laboratory by a special modified Bridgman technique. Measurements of the electrical conductivity and Hall effect between 141 K and 553 K were carried out on SnSe sample in two crystallographic directions. The investigated sample was found to be of p-type conductivity. The Hall mobilities parallel and perpendicular to layers plane at room temperature, were  $7835.9 \text{ cm}^2/\text{V} \cdot \text{s}$  and  $7274.7 \text{ cm}^2/\text{V} \cdot \text{s}$ , respectively. The free carrier concentration  $P = 3.52 \times 10^{12} \text{ cm}^{-3}$  at room temperature. Also, the thermoelectric power (TEP) was investigated in the temperature range from 176 to 553 K. The relations between the thermoelectric power and the concentration of charge carriers and electrical conductivity were studied. Mobilities, effective masses, relaxation times, diffusion lengths and diffusion coefficients both for majority and minority carriers were obtained at room temperature.

**Key Words:** SnSe Single crystal, Hall Coefficient, thermoelectric power.

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