

Title	Electroluminescence in thin films of evaporated ZnS; Cu, Mn, Cl
Sub Title	
Author	浜中, 宏一 (Hamanaka, Koichi)
Publisher	慶應義塾大学藤原記念工学部
Publication year	1967
Jtitle	Proceedings of the Fujihara Memorial Faculty of Engineering Keio University (慶應義塾大学藤原記念工学部研究報告). Vol.20, No.81 (1967.) ,p.222(46)- 222(46)
JaLC DOI	
Abstract	
Notes	Summaries of Doctor and Master Theses
Genre	Departmental Bulletin Paper
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO50001004-00200081-0046

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Electroluminescence in Thin Films of Evaporated ZnS ; Cu, Mn, Cl

Kohichi HAMANAKA*

In this paper, the temperature dependence, initial performance and emission spectra of thin films of evaporated ZnS ; (Cu, Mn, Cl.), are studied.

In the work, these films were prepared by vacuum deposition. Film thickness falls in the region of 5000\AA to 1μ . These thin films are solid, homogeneous, transparent and do not contain any dielectric binder. The excitation of these films was made with unipolar pulsed electric field. The temperature dependence of electroluminescence of the films was studied in the temperature range from -180°C to room temperature. EL-brightness of these films increased with decrease of temperature and one weak but defined peak was observed in the region from -80°C to -100°C . On the basis of increase in EL-brightness at low temperature region, it is deduced that collision ionization is the dominant mechanism for liberation of electrons from traps and luminescent centers at low temperature. Initial performance of aging in EL-brightness shows a tendency of concentration quenching from locally concentrated luminescent centers. In the emission spectra, two bands are observed. One is yellow with the peak at $585\text{ m}\mu$. Another is blue but very weak.

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