

# Turkish Journal of Physics



Turkish Journal

of

Physics

## The Growth of p-Type $A^{III}B^{III}C_2^{VI}$ Single Crystals

Bekir GÜRBULAK, Cevdet COŞKUN, Seydi DOĞAN,  
Aytunç ATEŞ, Yahya Kemal YOGURTÇU  
Atatürk Üniversitesi, Fen-Edebiyat Fakültesi, Fizik Bölümü,  
25240 Erzurum-TURKEY

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



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

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**Abstract:**  $A^{III}B^{III}C_2^{VI}$  single crystals were grown by the modified Bridgman-Stockbarger method, a procedure similar to direct freezing in our crystal growth laboratory.  $A^{III}B^{III}C_2^{VI}$  compounds are collected into two groups (III. group: Tl, Ga, In and VI. group: Se, S, Te): 1.  $TlGaSe_2$ ,  $TlGaS_2$  and  $TlInS_2$  have layer structure. 2.  $TlInSe_2$ ,  $TlInTe_2$  and  $TlGaTe_2$  have chained structure. The main reasons such crystals grown with this method is similar to the direct freezing method because 1) quality of crystals is the same as crystals grown by other methods, and 2) growth time of crystals is shorter by about 5-10 days. None of the grown crystals had cracks and voids on the surface. Freshly cleaved crystals had a mirror-like surface and there was no need for mechanical or chemical polishing. The X-ray Laue back reflection method was used to test the crystallinity of the prepared samples. It was found that the crystals was p-type by hot probe technique. The ingots produced were single crystals and the useful region of single crystal was approximately 90% of the bulk.

**Key Words:**  $A^{III}B^{III}C_2^{VI}$  compounds, furnace, ampoule shapes, crystal growth laboratory, layer and chained structure, single crystal.

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Turk. J. Phys., **24**, (2000), 29-38.

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