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The growth of alkali halide cesium iodide single crystal in five zone furnace by Bridgman method

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Abstract: In this research, the vertical Bridgman method has used to perform the single crystal growth of cesium iodide alkali halide. To this purpose, a vertical cylindrical furnace equipped with electric elements with five different thermal regions has been designed and constructed. The temperature gradient of the furnace can be controlled up to 1000°C with 0.1°C accuracy. Several cesium iodide sample crystals has been grown with this furnace and then the X-ray diffraction characterizations have been undertaken. The photoluminescence spectrum and the hardness properties of the crystals samples have been studied as well as the measurements of etch-pits of single crystals. Since the pure cesium iodide exhibits scintillation properties, the gamma-ray spectroscopy has also been undertaken.

Keywords: *Alkali halide; Bridgman method; Cesium Iodide; XRD; hardness; etch pits.*

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