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**Cathodoluminescence studies of commercial and nano-structured scintillators** WARREN MCDOANLD, GEORGE MCKINNEY, MARIAN TZOLOV, Lock Haven Univ — Scintillators have applications in fundamental research and in consumer products, e.g. detectors, scanners, and televisions. This research focused on analyzing the cathodoluminescence of different single-crystal scintillators with an originally developed method for evaluation of their performance, which allows for a direct comparison of different scintillators. We have studied yttrium aluminum garnet (YAG), yttrium aluminum perovskite (YAP) scintillators, zinc oxide single crystal, zinc tungstate single crystal, zinc oxide nanowires, and zinc tungstate film. The commercial scintillators are covered with conductive film which prevents low energy electrons from effectively interacting with the scintillator. We have varied the voltage accelerating the electrons with the intention of finding the threshold below which this effect will impact the performance of the scintillators. The same procedure was followed for the nanowires and zinc tungstate film which have enough conductivity and don't require a top conducting film. The threshold was established to be around 3 kV for the YAG and there is no threshold for the films, which perform much better at these low voltages. This property of the films has the potential for application in desktop scanning electron microscopes, where the accelerating voltage is low. The voltage dependence of the cathodoluminescence intensity follows an exponential trend and we present a model explaining it.

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