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Scintillator for low accelerating voltage scanning electron microscopy imaging CHRISTOPHER BOWSER, MARIAN TZOLOV, Lock Haven Univ, NICHOLAS BARBI, Pulsetor, LLC — Scintillators are essential in detecting electrons in SEM. The conventional scintillators such as YAP and YAG have poor response at low accelerating voltages due to a top conductive layer of ITO or Al. We have developed a thin film $ZnWO_4$ scintillator with high photoluminescence quantum efficiency of 60% with enough electrical conductivity to prevent charging. We are showing that the $ZnWO_4$ films are effective in detecting electrons at low accelerating voltages. This makes it a good option for a top layer on crystalline scintillators and we have integrated $ZnWO_4$ with YAP to explore the high response of YAP at high electron energies and the effective response of $ZnWO_4$ at low electron energies. We will compare the spectral intensities over a range of accelerating voltages between 1 and 30kV between the conventional and coupled thin film scintillator. The results are interpreted using a simulation of the depth profile of the electron penetration in the scintillator using CASINO. We have verified the absence of charging by measuring the sum of the secondary and backscattered electron coefficients. We have built detectors with the combined scintillators and we will compare SEM images recorded simultaneously by conventional and $ZnWO_4$-based scintillators.

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