

Cesium Hafnium Chloride, a Non-Hygroscopic, High-Performance Scintillator

Tuesday, 19 September 2017 12:00 (15 minutes)

Cesium hafnium chloride (CHC, Cs_2HfCl_6) is a recently-discovered scintillator with radiation detection properties superior to the incumbent detectors NaI(Tl) and CsI(Tl). Advantages of CHC include: an excellent energy resolution, no self-absorption, no self-activity, and non-hygroscopicity. Our first-grown crystals were measured to have a light yield of 30,000 ph/MeV and an energy resolution of 3.3%. With a decay time close to 4 microseconds, CHC is well-suited to most low-count scenarios encountered in homeland security applications. This presentation will address techniques for charge purification and preparation, crystal growth by the Bridgman technique, as well as the challenges associated with handling this line compound. Finally, we will discuss the use of alloying to reduce the decay time to 2 microseconds, and to enable dual-mode neutron/gamma detection.

This work has been supported by the US Department of Energy, under competitively awarded contract DE-SC0015733. This support does not constitute an express or implied endorsement on the part of the government.

Primary authors: Dr LAM, Stephanie (CapeSym, Inc.); Prof. BURGER, Arnold (Fisk University); Dr MO-TAKEF, Shariar (CapeSym, Inc.)

Presenter: Dr LAM, Stephanie (CapeSym, Inc.)

Session Classification: Novel Materials

Track Classification: S06_Novel materials (Orals)