

**LUMINESCENCE AND DEFECT
CHEMISTRY OF Me^{3+} IN BaHfO_3**

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In addition to the orange-red luminescence of Eu^{3+} , we have also observed a blue luminescence peak in $\text{BaHfO}_3:\text{Eu}^{3+}$ with an Stokes shift of $>8000\text{ cm}^{-1}$. We also have observed a similar blue luminescence when doping BaHfO_3 with optically inactive ions that cannot be easily reduced to a divalent state such as Y^{3+} . This leads to the proposal that the blue luminescence in $\text{BaHfO}_3:\text{Eu}^{3+}$ or $\text{BaHfO}_3:\text{Y}^{3+}$ is due to a defect induced by the incorporation of a trivalent ion into the perovskite host lattice. This proposal is further supported by the reduction in the blue luminescence intensity when Eu^{3+} is charge compensated by monovalent ions. In addition, there is significant luminescence buildup and afterglow in these compounds. In this paper, we will be investigating the luminescence of $\text{BaHfO}_3:\text{Me}^{3+}$ and use this information to delineate the defect chemistry of these materials.