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Effects of Salt Additives in the Performance of iridium-based LEC devices LYNDON BASTATAS, MELANIE BOWLER, YULONG SHEN, Department of Physics, The University of Texas at Dallas, 800 W. Campbell Rd., Richardson, Texas 75080, USA, KRISTIN JEANNETTE SUHR, MATTHEW DARREN MOORE, BRAD HOLLIDAY, Department of Chemistry, The University of Texas at Austin, Austin, Texas 78712, USA, JASON SLINKER, Department of Physics, The University of Texas at Dallas, 800 W. Campbell Rd., Richardson, Texas 75080, USA — Light-emitting electrochemical cells (LECs) are low-cost, promising alternatives of organic light emitting diodes (OLEDs). Their single-layer architecture circumvents the multi-layer deposition requirement of state-of-the-art OLED devices. They are solution-processable so it also offers wider applicability. Recent studies have reported that addition of salt additives enhances the turn-on time and maximum brightness of LEC-based devices. So we investigated the effect of LiPF6 in iridium-based LECs by performing impedance spectroscopy coupled with device study. From this analysis we model the device to an equivalent circuit and extracted some parameters such as the electrical resistance of the active layer and bulk ionic resistances of the device. We find that there is a correlation between the resistances, salt concentration and characteristics of the device. The over-all resistance decreases as the salt concentration is increased, reaching to a certain threshold where addition of more ions only adversely affects the device. Our result highlights that there is an optimal salt concentration where the performance of the device is enhanced.

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