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Improving Light-Emitting Electrochemical Cells with Ionic Additives JASON SLINKER, YULONG SHEN, The University of Texas at Dallas, BRAD HOLLIDAY, The University of Texas at Austin — Light Emitting Electrochemical Cells (LEECs) from ionic transition metal complexes (iTMCs) may serve as a new lighting technology candidate. These simple, cost effective devices are solution processable and compatible with low-temperature assembly and reel-to-reel fabrication under ambient conditions. However, these devices have yet to achieve the stringent operational benchmarks required for lighting. We used the archetypal iridium iTMC as the emissive material in LEECs and blended in alkaline additives to control ionic space charge effects and substantially improve performance. For lithium additives, turn-on time improved drastically and the maximum luminance was increased to practical lighting levels without substantially affecting device lifetime. We have also studied other alkaline salts and justified their relative impact on device performance in view of double layer charging. These observations suggest that iTMCs from LEECs have the potential to serve as bright, long-lasting light sources.

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