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(54) Title: SUBSTRATE FOR LITHIUM THIN FILM BATTERY

(57) Abstract: When attempting to make a lithium ion-switching device such as a high-efficiency, all-solid state, thin film battery the choice of carrier substrate is all important. As such a substrate must withstand a high temperature under an oxidising atmosphere to crystallise certain layers making up the device, the substrate should not oxidise thereby ruling out most metals. The invention now describes a class of ternary alloys of which the oxidation rate is limited and that are useable to produce thin film batteries on. At least one element with a high affinity to oxygen (Al, Mg, Zn or Si) is present in the alloy. The other two metallic elements reduce the growth of the oxide of this first element. In addition the thus formed oxide scale turns out to be an effective barrier to lithium. Surprisingly, the scale shows nanoscopic voids that allow for sufficient electrical contact with the device layers, thereby eliminating the need for a separate current collector. As the ternary alloy can be made in a flexible foil, it can advantageously be used in a roll-to-roll process.



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