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(54) **OPTOELECTRONIC AND MICROELECTRONIC DEVICES INCLUDING CUBIC ZNMGO AND/OR CDMGO ALLOYS**

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(57) **ABSTRACT**

An electronic device has an alloy layer containing magnesium oxide and at least one of zinc oxide and cadmium oxide and having a cubic structure on a substrate. The alloy layer may be directly on the substrate or, alternatively, one or more buffer layers may be between the alloy layer and the substrate. The alloy layer may be domain-matched epitaxially grown directly on the substrate, or may be lattice-matched epitaxially grown directly on the buffer layer. The cubic layer may also be used to form single and multiple quantum wells. Accordingly, electronic devices having wider bandgap, increased binding energy of excitons, and/or reduced density of growth and/or misfit dislocations in the active layers as compared with conventional III-nitride electronic devices may be provided.

42 Claims, 8 Drawing Sheets