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## Vapor Phase Epitaxy of Magnesium Oxide on Si(001) Using a Single Precursor

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Magnesium oxide is thermodynamically very stable, has a low dielectric constant and a low refractive index, and has been widely used as substrate for growing various thin film materials, particularly oxides of the perovskite structure. There has been a considerable interest in integrating the physical properties of these oxides with semiconductor materials such as GaAs and Si. In this regard, it is considered very important to be able to grow MgO buffer layers epitaxially on the semiconductors. Various oxide films can then be grown on such buffer layers, eliminating the need for using MgO single crystal substrates.

Vapor phase epitaxy of magnesium oxide has been accomplished on Si(001) substrates in a high vacuum chamber using the single precursor methylmagnesium *tert*-butoxide in the temperature range 750-800 °C. For the epitaxy of the MgO films, SiC buffer layers had to be grown on Si(001).

The films were characterized by reflection high energy electron diffraction (RHEED) in situ in the growth chamber, and x-ray diffraction (XRD), x-ray pole figure analysis, scanning electron microscopy (SEM), and x-ray photoelectron spectroscopy (XPS) after the growth.