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## Supersonic Molecular Jet Epitaxy Of Cubic SiC Thin Films Using Single Source Organosilicon Compounds

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SiC has an outstanding set of physical and chemical properties which make it suitable for an advanced applications such as high power, high frequency, and high temperature electronic devices. In particular, its wide band gap, high electron mobility, high thermal conductivity, high elastic module, etc. make it an ideal material for blue LED, UV photodiode, MOSFET, X-ray lithography masks.

For all electronic and optoelectronic devices, the active region is fabricated in an epilayer. Among many polytypes of SiC, only cubic SiC can be grown on Si substrates. Most SiC films deposited on Si were grown using separate sources for Si and C atoms. This method, however, may result in a deviations from stoichiometry and has the disadvantage of having to maintain high temperatures which may cause serious problems in the SiC/Si structure, i.e., high tensile stress and crystal defects. Reduction of growth temperature and defect density has been an especially challenging goal in the device fabrication. So it is desirable to employ a sources that contain both Si and C atoms in the same molecule.

In this talk, we will discuss the advantage of single molecular precursors for the cubic SiC film growth on Si as well as the introduction of new film growth and characterization method. The availability of single source that bonded Si and C aoms directly, therefore, may be effective for forming Si-C bonds on the surface of growing films and helpful to the stoichiometric growth at low temperatures.