

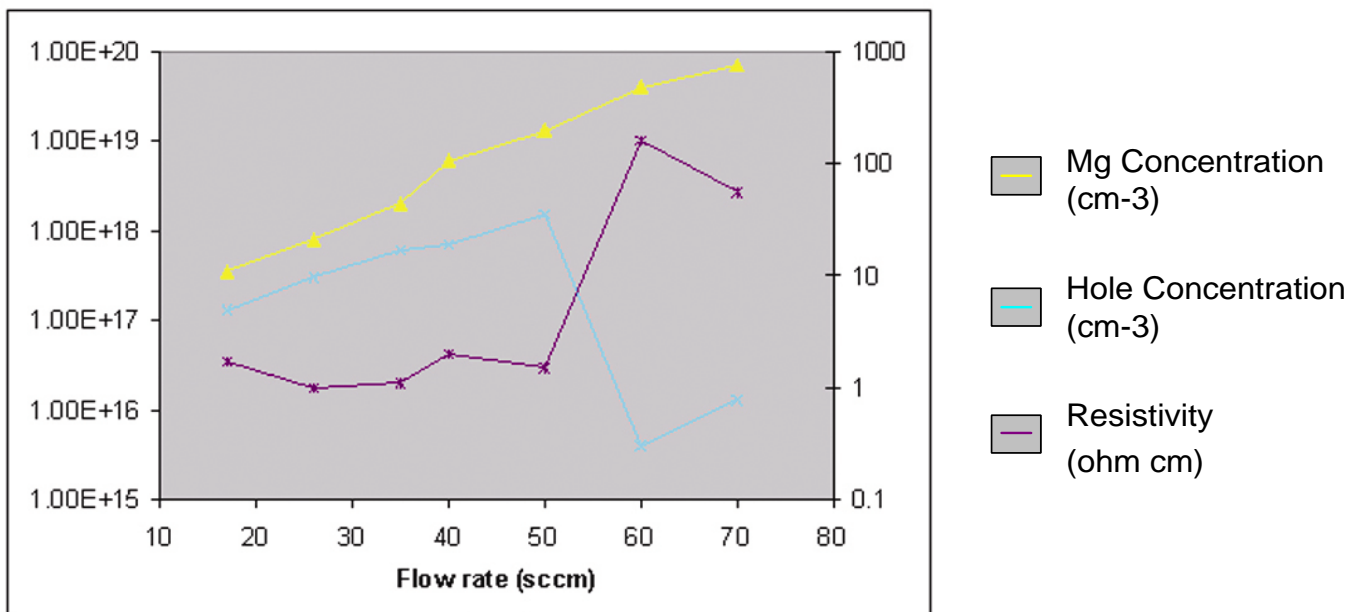
technical bulletin

Solution Magnesium™

Bis(cyclopentadienyl)magnesium, (Cp_2Mg) is a common source for p-type doping in GaN and AlInGaP materials. However, it is a white crystalline solid with a very low vapor pressure, which makes its usage in the MOCVD application very difficult. Typical problems associated with the transport of a solid and significant memory effects have been experienced when using solid Cp_2Mg resulting in uncontrollable doping levels.

SAFC Hitech has addressed these problems and low transport efficiencies by developing Solution Magnesium™. In this source, Cp_2Mg is dissolved in an organic media which is essentially non-volatile. The advantage of this approach is a consistent delivery of the magnesium source with identical vapour pressure to Cp_2Mg . The solvent (1) reduces the detrimental channeling effects associated with solid sources and (2) creates an improved delivery system by allowing more contact time between the carrier gas (hydrogen) and the magnesiumocene (3) reduces the memory effects by increasing transport efficiency.

The control of Mg incorporation in GaN is illustrated below.



Plot of Mg doping of GaN using Solution Magnesium™