Method for Improving Performance of a Substrate Carrier

[0001] This application is a continuation of U.S. Patent application Ser. No. 12/629,467, entitled "Method for Improving Performance of a Substrate Carrier" filed on Dec. 2, 2009. This application is herein incorporated by reference.

The section headings used herein are for organizational purposes only and should not to be construed as limiting the subject matter described in the present application in any way.

Introduction

[0002] Many material processing systems include substrate carriers for supporting and sometimes transporting substrates during processing. The substrate is often a disc of crystalline material that is commonly called a wafer. One such type of material processing system is a vapor phase epitaxy (VPE) system. Vapor phase epitaxy is a type of chemical vapor deposition (CVD) which involves directing one or more gases containing chemical species onto a surface of a substrate so that the reactive species react and form a film on the surface of the substrate. For example, VPE can be used to grow compound semiconductor materials on substrates.

[0003] Materials are typically grown by injecting at least one precursor gas and, in many processes, at least a first and a second precursor gas into a process chamber containing the crystalline substrate. Compound semiconductors, such as III-V semiconductors, can be formed by growing various layers of semiconductor materials on a substrate using a hydride precursor gas and an organometalic precursor gas. Metalorganic vapor phase epitaxy (MOVPE) is a vapor deposition method that is commonly used to grow compound semiconductors using a surface reaction of metalorganics and hydrides containing the required chemical elements. For example, indium phosphide could be grown in a reactor on a substrate by introducing trimethylindium and phosphine.