Abstract

In our work, we developed a data processing program, including data processing codes, sliding window algorithm, and a graphical user interface (GUI) implementation. With the sliding window algorithm, we are able to accurately track the fluctuation of residual gases during the deposition period, providing precise time-indexed data.

By utilizing this program, we delved into the relationships between deposition process parameters and the corresponding residual gases for metal layer stacks, including n or p doped Ti/Pt/Au InGaAs and Ni/Ge/Au InGaAs. Our investigation led to the identification of O-H bonds adsorbed on the platinum (Pt) surface and the primary adsorbed and desorbed gas on the germanium (Ge) surface, hydrogen gas (H_2).

Additionally, we examined the influence of temperature on the residue issues left by nlof and AZ1505 photoresists, and we explored the underlying causes of the bursting observed in the photoresist material PMMA during the deposition process.