ABSTRACT

PLASMA ASSISTED ATOMIC LAYER DEPOSITION TITANIUM OXIDE FOR CONFORMAL ENCAPSULATION AND GAPFILL APPLICATIONS

The embodiments herein relate to methods and apparatus for depositing an encapsulation layer over memory stacks in MRAM and PCRAM applications. The encapsulation layer is a titanium dioxide (TiO_2) layer deposited through an atomic layer deposition reaction. In some embodiments, the encapsulation layer may be deposited as a bilayer, with an electrically favorable layer formed atop a protective layer. In certain implementations, gaps between neighboring memory stacks may be filled with titanium oxide, for example through an atomic layer deposition reaction or a chemical vapor deposition reaction.

FIG. 5