

ABSTRACT

Embodiments of the present invention provide a method for removing a barrier layer of a metal interconnection on a wafer, which remove a single-layer metal ruthenium barrier layer. A method comprises: oxidizing step, is to oxidize the single-layer metal ruthenium barrier layer into a ruthenium oxide layer by electrochemical anodic oxidation process; oxide layer etching step, is to etch the ruthenium oxide layer with etching liquid to remove the ruthenium oxide layer. The present invention also provides a method for removing a barrier layer of a metal interconnection on a wafer, using in a structure of a process node of 10nm and below, wherein the structure comprises a substrate, a dielectric layer, a barrier layer and a metal layer, the dielectric layer is deposited on the substrate and recessed areas are formed on the dielectric layer, the barrier layer is deposited on the dielectric layer, the metal layer is deposited on the barrier layer, wherein the metal layer is a copper layer, the barrier layer is a single-layer metal ruthenium layer, and the method comprises: thinning step, is to thin the metal layer; removing step, is to remove the metal layer; oxidizing step, is to oxidize the barrier layer, and the oxidizing step uses an electrochemical anodic oxidation process; oxide layer etching step, is to etch the oxidized barrier layer.