METHOD FOR FORMING A COPPER (Cu) BARRIER/SEED BILAYER FOR INTEGRATED CIRCUIT DEVICE FABRICATION

ABSTRACT

A structure and method for forming a relatively thin diffusion barrier/seed bilayer for copper metallization in an electronic device is disclosed. A single layer of an alloy is formed over a dielectric (and possibly the copper layer). The alloy includes a copper platable metal (e.g., ruthenium) and a nitride forming material (e.g., tungsten) and nitrogen. The alloy layer is annealed, and the alloy naturally segregates into two layers. The first layer is a barrier layer including the nitride forming material and nitrogen. The second layer is a seed layer including the copper platable metal.

Fig. 4