Method of electrolytically forming conductor structures from highly pure copper when producing integrated circuits

Abstract:

The invention relates to a method of electrolytically forming conductor structures from highly pure copper on surfaces of semiconductor substrates (wafers) **1**, which surfaces are provided with recesses **2**, when producing integrated circuits. The method includes the following method steps: a. coating the surfaces of the semiconductor substrates **1**, which are provided with the recesses **2**, with a full-surface basic metal layer in order to achieve sufficient conductance for the electrolytic deposition; b. full-surface deposition of copper layers **3**, of uniform layer thickness, on the basic metal layer by an electrolytic metal deposition method by bringing the semiconductor substrates into contact with a copper deposition bath, the copper deposition bath containing at least one copper ion source, at least one additive compound for controlling the physico-mechanical properties of the copper layers as well as Fe(II) and/or Fe(III) compounds, and an electric voltage being applied between the semiconductor substrates and dimensionally stable counter-electrodes, which are insoluble in the bath and are brought into contact therewith, so that an electric current flows between the semiconductor substrates **1** and the counter-electrodes; c. structuring the copper layer **3**.

(Fig. 1)