**MOS structures quality under annealing influence**

Publisher: IEEE

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**Abstract:**

This paper reports the experimental results relative to the characterization of a MOS structure with polysilicon grid, after high temperature annealing under dry oxygen. These results permitted to observe a change of the chemical composition of the layers deposited on SiO 2 , in relation with the oxidation rate growth. One notes in particular, a growth of the peaks intensities associated to Si-O and Si-O-Si bonds, translating an increasing of the oxygen quantity in the polysilicon. One also observes a tendency toward the disappearance of some bonds of Si-H x (x=1, 2, 3) and Si-Si type, to the profit of others as Si-O-Si and Si-O, what explains itself by hydrogen atoms desorption under annealing effect. On the other hand, the electrical results confirm that the concentration of free carriers stretches toward the doping one, for the high levels of doping used here, while the mobility increases with the growth of annealing temperature. Otherwise, the C(V) curves show that the flat band tension V FB undergoes a growth linked to the oxidation temperature increasing, what is justified by the diffusion activation of charges like O 2 - and B - , and their trapping in the oxide. Besides, the interface states density D it that is in the order of 2×10 12 cm -2 eV -1 , characterizes an oxide of medium quality and is reduced of half when the annealing temperature passes the 1000°C.

**Published in:** [2013 International Conference on Applied Electronics](https://ieeexplore.ieee.org/xpl/conhome/6619550/proceeding)

**Date of Conference:** 10-12 Sept. 2013

**Date Added to IEEE *Xplore*:** 21 October 2013

**ISBN Information:**

**Print ISSN:** 1803-7232

**INSPEC Accession Number:** 13860626

Publisher: IEEE

**Conference Location:** Pilsen, Czech Republic

**I. Introduction**

The fabrication of high integration density circuits requires the reduction more and more pushed of the components dimensions, not only on a horizontal scale (surface) but also on a vertical scale (depth). It is very important to know and control the properties of the very thin films, in order to foresee their electrical behaviour that is very linked to the film/substrate interface quality. The replacement of a metal by a heavily doped polycrystalline silicon layer, give rise to a poly-oxide-mono structure (POS) that is simple to achieve technologically, and submits itself easily to measurements under tips. The characterization by capacity-tension method is generally used in these structures' case, because the C(V) curves permit to reach, among others, the density of the fixed charges present in the silica layer. The POS structures, where the Si-LPCVD films play the role of grid electrode, have also been characterized from physicochemical point of view.

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