**ROBUST MICROELECTRODES FOR ELECTROCHEMICAL CHARACTERIZATION OF BIOMOLECULAR LAYERS**

Y. Temiz, A. Ferretti, Y. Leblebici, C. Guiducci
(1) Laboratory of Life Sciences Electronics (CLSE), EPFL
(2) Microelectronic Systems Laboratory (LSM), EPFL

**Project objective:**
This paper presents a robust electrochemical detection system composed of microfabricated electrodes and a potentiostat circuit developed for quantitative detection of biomolecules. This system offers a reliable and stable operation owing to very stable oxide passivation layer, withstanding aggressive cleaning techniques and chemicals involved. The adhesion of oxide to Au and Pt is significantly enhanced by adding slots to the metals and optimizing the metal lift-off process. The results demonstrate that the developed microelectrodes provide stable and repeatable signals.

- Ti/Au (20/200nm) lift-off
- Ti/Pt (20/200nm) lift-off
- 1µm SiO₂ sputtering
- Photolithography patterning
- Wet SiO₂ etching (BHF 7:1)

**Figure 1:** Simplified version of the process flow used in the fabrication of microelectrodes.

**Figure 2:** (A) Microelectrodes showing severe oxide delamination problem. (B) Improved electrodes demonstrating no visible defect.

**Figure 3:** A very compact Cyclic Voltammetry (CV) measurement system.

**Figure 4:** CV of TE buffer and 0.4mM Ferrocenium (Fc+), recorded simultaneously from two identical cells placed 12 mm far away.

**Techniques employed:** Optical lithography, Lift-off, Sputtering, Wet etching.

**Publications:**

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