Instytut Technologii Elektronowej
Al. Lotników 32/46, 02-668 Warszawa
Department of Materials and Semiconductor Structures Research

Metallic source and drain for advanced MOS technology
METAMOS, IST Contract no. 016677

COORDINATOR

Emmanuel DUBOIS, IEMN/ISEN - UMR CNRS 8520
Villeneuve d'Ascq, France

PARTICIPANTS

- Centre National de la Recherche Scientifique, CNRS, France
- Université Catholique de Louvain-la-Neuve, UCL, Belgium
- Instytut Technologii Elektronowej, ITE, Poland
- University of Salamanca, USAL, Spain
- ST Microelectronics, ST, France
- Philips Semiconductors, PS, France

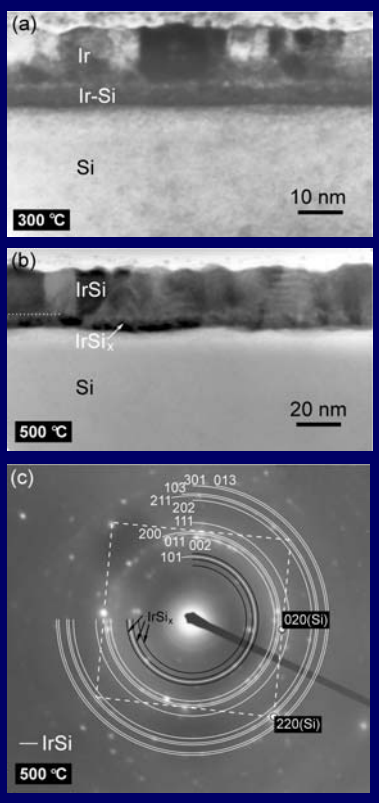
OUR ROLE IN THE PROJECT

Transmission Electron Microscopy phase and structural analysis of silicide Schottky contact (Ir, Pt, Er, Yb) structures.

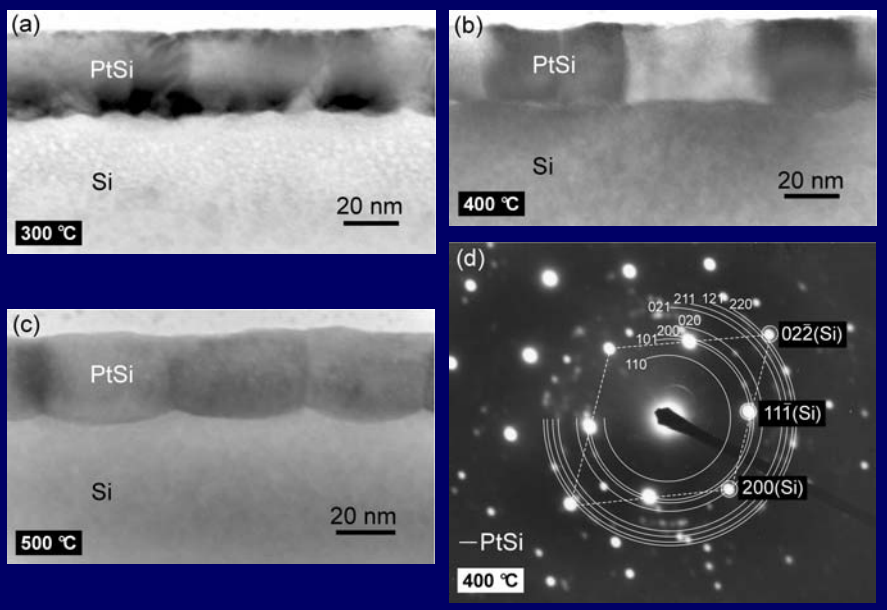
PROJECT DESCRIPTION

Among the main difficulties to overcome toward the 10 nm gate length MOSFET, many challenges are associated with the source/drain (S/D) regions. The tight constraints of dopant activation to achieve very highly doped junctions, extremely steep lateral profiling, low contact specific resistance have motivated a renewed interest in MOSFETs architectures that integrates metallic Schottky S/D. Based on that background, the METAMOS project proposes the design, optimisation, fabrication and characterization of metallic Schottky-Barrier-like MOSFETs to solve critical problems associated with the source/drain architecture and more specifically due to the specific contact resistance at the metal (or silicide) to silicon interface. The major objective is to develop and fully characterize advanced very low Schottky barriers (<0.1 eV) primarily based on silicides of platinum and iridium for p-type contacts and rare earth silicides (erbium, ytterbium) for n-type contacts.

RESULTS



TEM analysis of the Ir/Si structure annealed at: 300 (a) or 500 °C (b) and diffraction pattern of the structure annealed at 500 °C (c).



TEM cross-sections of Pt/Si structure annealed at: 300 (a), 400 (b), 500 °C (c) and diffraction pattern of the structure annealed at 400 °C (d) .

Contact person: Jacek Ratajczak
phone: +48 22 5487763, rataj@ite.waw.pl