



	<b>Experiment title:</b> Structure of the intermetallic compounds formed during the growth of semiconductor nanowires	<b>Experiment number:</b> HS-7396
<b>Beamline:</b> BM08	<b>Date of experiment:</b> from: 24 June 2009 to: 30 June 2009	<b>Date of report:</b> 1 March 2010
<b>Shifts:</b> 18	<b>Local contact(s):</b> Dr. Francesco D'Acapito	<i>Received at ESRF:</i>
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## Report:

The aim of the experiment was to measure the Au environment in the AuGa and AuIn intermetallic compound that form during the growth of GaAs or InAs nanowires. Samples of GaAs, InAs and InGaAs nanowires, grown by molecular beam epitaxy were measured at the beamline BM08 during the allotted time.

The experiments were negatively affected by the presence in the samples of a “parassite” two-dimensional layer of the grown materials that gave Ga- and As-related signals that strongly shadowed the Au  $L_{\alpha}$  fluorescence signal. Several attempts were made to use a glancing geometry for total surface reflection, but although some improvements were found, the signal-to-noise ratio of the measurements was not enough to extract a good spectrum.

The experiment was also disturbed by a major vacuum leak which occurred abruptly in the beamline mirror chamber, not solvable during the experiment period.

Despite the lack of positive results on the specific proposal, some success was attained in testing the Au environment in the AuSi nanoparticles that form during the growth of Si nanowires. The samples, grown by plasma-enhanced chemical vapor deposition, were brought to ESRF for trials in the case some time had been available. The topic of the trials was the same of the proposal, but the material different. The experiments performed show that a nice Au-LIII signal che be extracted and that the presence of an AuSi intermetallic compound can be detected. Those preliminary results are the basis of a new proposal that is going to be presented at the 1 March 2010 deadline.