

Analysis of elemental composition of $\text{Fe}_{1-x}\text{Ni}_x$ and $\text{Si}_{1-x}\text{Ge}_x$ alloy thin films by Electron Probe Microanalysis (EPMA) and micro-focus X-ray Fluorescence ($\mu\text{-XRF}$)

Vasile-Dan Hodoroaba¹ | Ralf Terborg² | Stephan Boehm² | Kyung Joong Kim³

¹ Federal Institute for Materials Research and Testing (BAM), Division 6.1 Surface Analysis and Interfacial Chemistry, Berlin, Germany

² Bruker Nano GmbH, Berlin, Germany

³ Korea Research Institute of Standards and Science (KRISS), Division of Industrial Metrology, Daejeon, Korea

Correspondence

Vasile-Dan Hodoroaba, Federal Institute for Materials Research and Testing (BAM), 12200 Berlin, Germany.

Email: dan.hodoroaba@bam.de

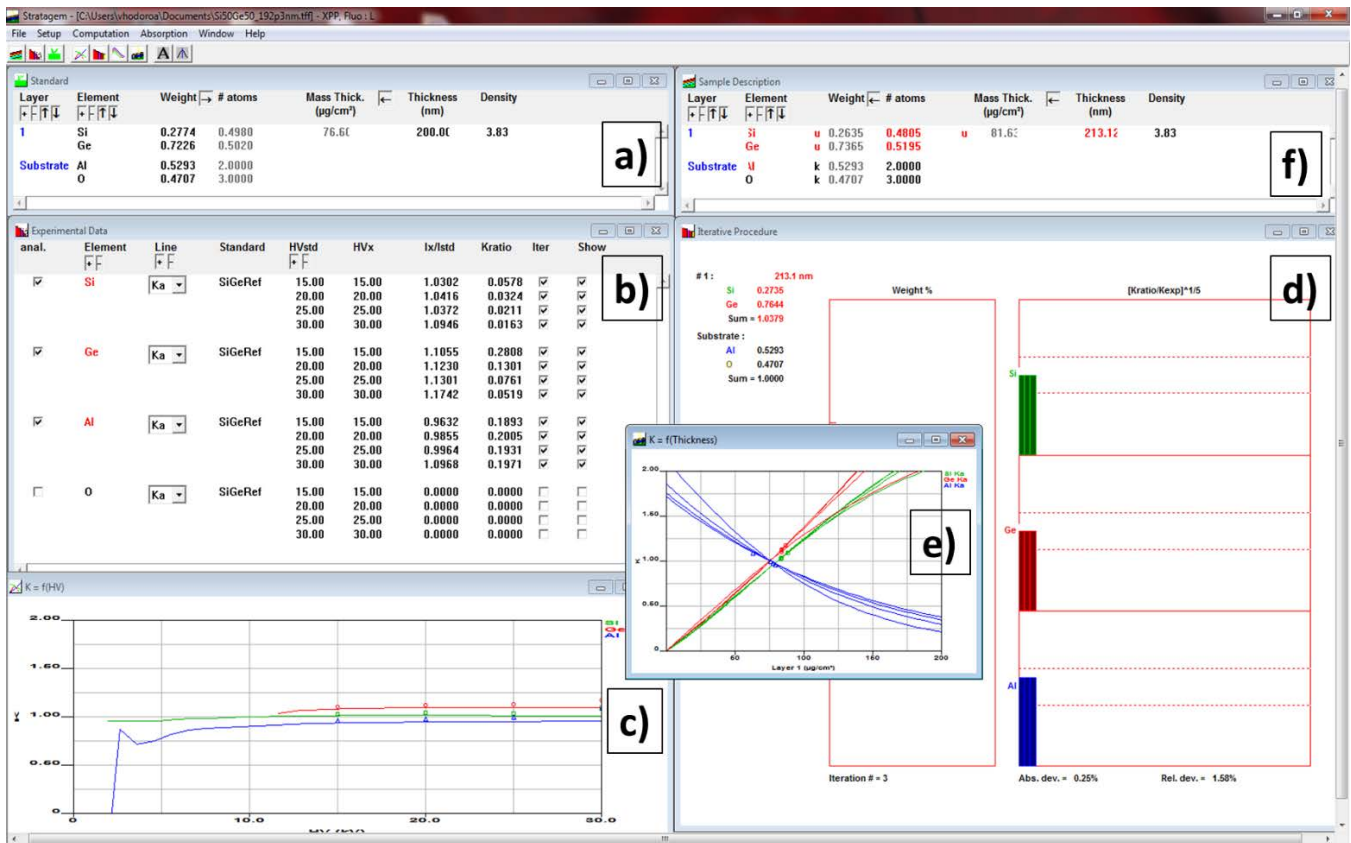


FIGURE S1 Excerpt from the graphical user interface of the Stratagem software package with the results of the ED-EPMA analysis (Lab 1) of the Si_{0.5}Ge_{0.5} thin film sample: a) input data for the reference sample Si_{27.74} mass-% Ge_{72.26} mass-% layer of 200 nm thickness with a theoretical density of 3.83 g/cm³ on Al₂O₃ substrate, b) measured *k*-values of Si Kα, Ge Lα, Al Kα and O K (not considered for iteration) at 15, 20, 25 and 30 kV relative to the reference sample from a), c) measured *k*-values of Si Kα, Ge Lα and Al Kα (points) and the corresponding Stratagem fits, d) iteration sequence with calculation of unnormalized elemental composition of the SiGe thin layer and of the substrate, e) mass deposition of the SiGe layer to be analysed as calculated for each measured X-ray line, and f) calculated normalised elemental composition and thickness of the ‘unknown’ (‘u’) SiGe layer. Note that in red is encoded unknown data.

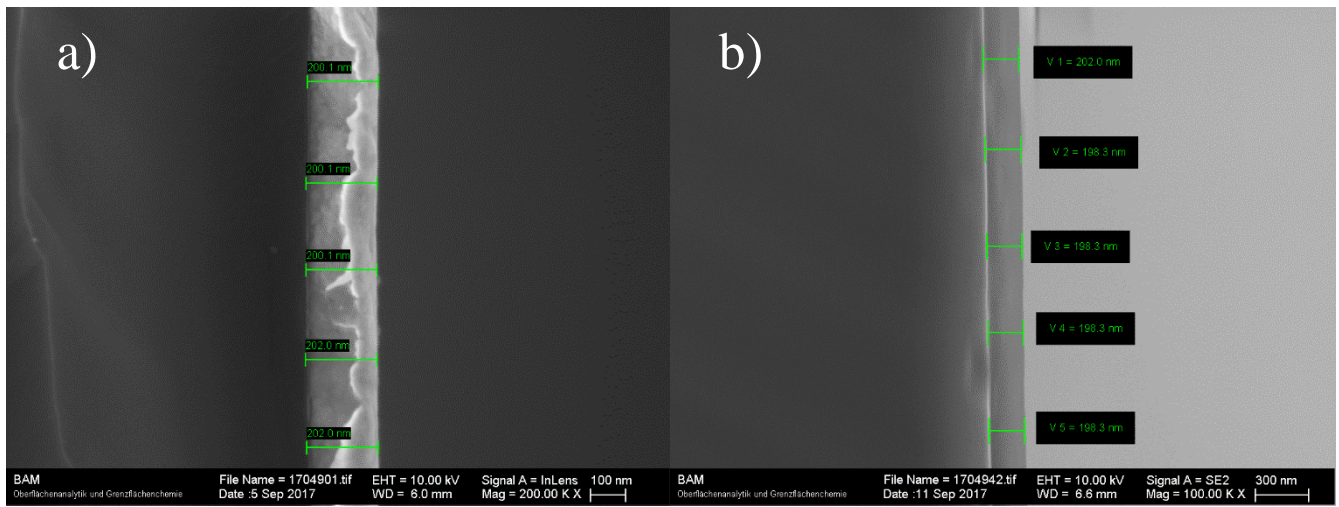


FIGURE S2 SEM micrographs of the two reference films after fracturing the samples: a) FeNi, and b) SiGe.