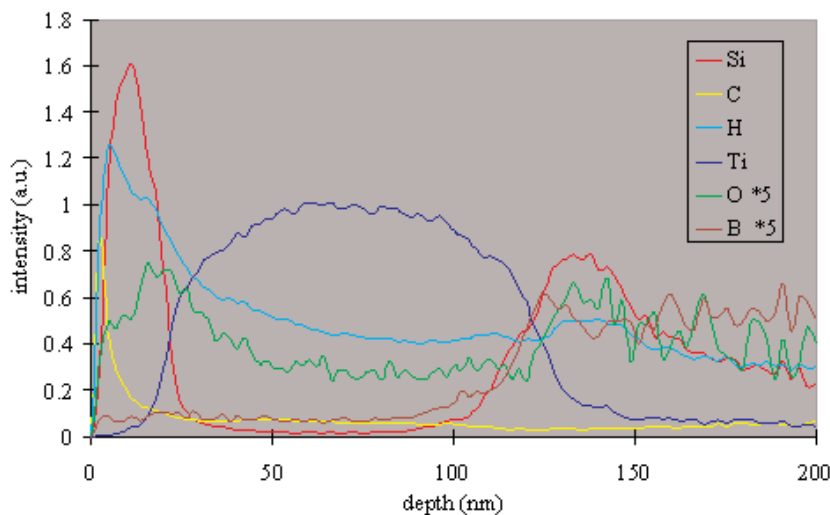


# Characterization of glass surfaces and coatings on glasses

Glass and glass surfaces are a new field of investigation for Glow Discharge but GD is very complementary to the classical technics used to study glasses : X ray fluorescence can do the bulk analysis but cannot study coatings or surface phenomena ; Electron Microscopy (Scanning EM or Transmission EM) gives images, allows local ana-

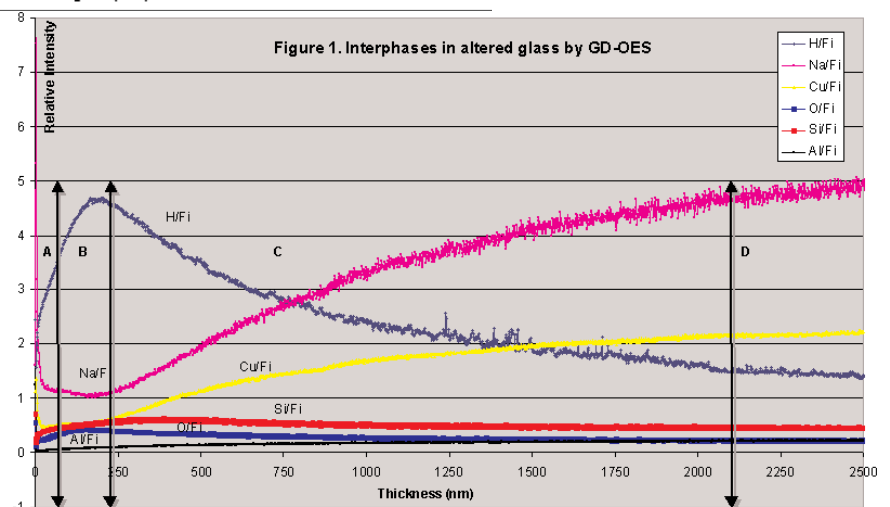
lysis (when coupled with an EDX probe) but may require heavy sample preparation, cannot measure the gas elements and sometimes lacks of sensitivity. In addition both the high energy X ray and the electron beams may alter the structure of the material to study.



Legend 1 : The first examples shows TiO<sub>x</sub> deposited on a glass substrate. A thin layer of silica is also seen at the extreme surface. The very high depth resolution of the GD technic makes it suitable to study multilayer films deposited on glasses for car windscreens or optical applications.

Legend 2 : The second example shows a vitreous ceramic (sodio-alumino-silicate glass doped in Cu) leached in an acid solution (HCl) at pH2 (pH allowed to vary) in a static chamber for one month. The objective was to analyse the altered layer and to characterize the potential chemical gradient by GD.

These alteration problems as well as the possible migration of heavy elements towards the surface are critical for the assessment of industrial and nuclear vitrified wastes. The obtained GD results have been correlated with other technics and were proved to be valid. Of special notice are the speed of analysis and the possibility to follow the H signal.



Key points : Glow Discharge could be applied to the study of coatings on glasses and glass surfaces.

Ref : Ph. le Coustumer, P. Chapon, H. François Saint Cyr and Mikael Motelica Heino, Surface analysis of non conductive materials by GDS, to be published in Fresenius