Microlamps have many applications as lightening for infrared micro spectroscopy and localized thermal treatment sources. The main objective of this work was to build microlamps and to analyze the structural modifications induced on the protective layers of the metallic filament by the heating process. Their production consists on films deposited by Plasma Enhanced Chemical Vapor Deposition (PECVD) and sputtering over silicon substrates [1-4]. The filament, composed by a thin chromium wire, is protected against oxidation by a top thin layer. Four different materials were used as protective layer: SiC, SiO$_x$N$_y$, AlN and TiO$_2$. The protective film is heated by the metallic filament and their chemical and structural properties may change, depending on the time interval and intensity of the applied current (up to 2h and 50mA). X-ray absorption near edge spectroscopy (XANES) measurements allowed investigating changes on the properties of the microlamp’s protective films heated under different polarization conditions. The LUCIA beam line of the synchrotron SOLEIL has a microfocus spot (3x3µm), permitting to evaluate the small thermally affected zone. The results showed that SiO$_x$N$_y$ film is thermally stable with negligible changes on the XANES spectra. A slight AlN oxidation is observed as heating rises which is particularly evident for the sample heated at extreme conditions. TiO$_2$ XANES spectra showed that the material is crystallized on rutile structure and is also thermally stable. SiC thin films, showed in Figure 1, were widely affected showing an oxidation process as the time interval and intensity of the current increase. In addition, once the films were deposited over the Cr filament, their XANES spectra are quite different from the standard sample (deposited over Si), even for the non-polarized microlamp, indicating a Cr contamination on the SiC structure. For technological purposes, the SiO$_x$N$_y$ and TiO$_2$ films are suitable as filament protective layer due to their high thermal stability.

![Figure 1: XANES spectra of SiC protective films under polarization.](image)