ESRF	**Experiment title:** Study of devitrification process in Fe-base bulk metallic glasses	**Experiment number**: 16-01-776
Beamline:	**Date of experiment**: from: 26/02/11 & 01/03/11 to:	**Date of report**: 27/02/14
Shifts: 9	**Local contact(s)**: Randolf Butzbach, Edmundo Fraga	*Received at ESRF:*

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Report:

The devitrification process of amorphous steels with composition $Fe_{65-x}Mo_{14}C_{15}B_6Cr_x$ (with x=0,2,4,6,8,10 atomic % of Chromium) was studied by means of in situ X-ray diffraction measurements. The evolution of the structure factor from amorpohous to completely crystalline state is shown in figure 1.

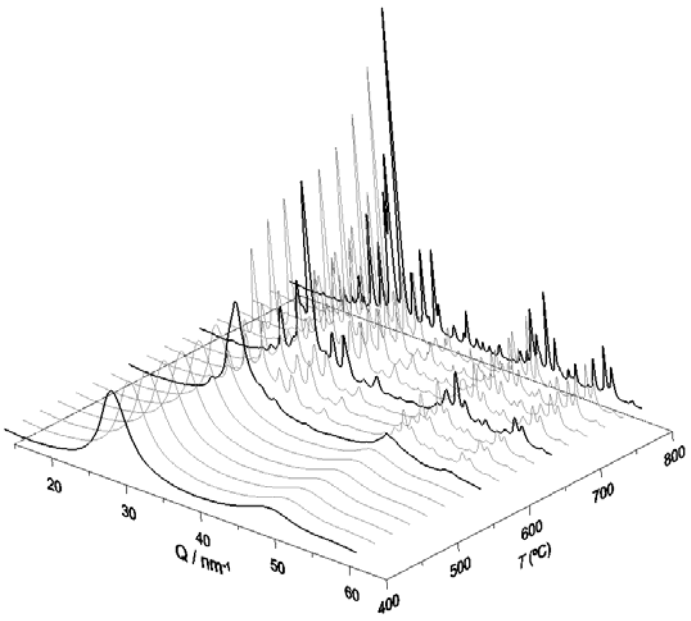

Figure 1

The analysis of the phases appearing during the devitrification revealed that the crystallization path is very constant in all the compositional series (Figure 2), with the Chromium content substituting Fe in the Fe-rich amorphous zones and crystalline phases. Mo segregation and posterior $(Mo,Fe)_6C$ precipitation is the first crystallization reaction found in all compositions and it is barely affected by the increase of Chromium content, which has the unique effect of gradually shifting the crystallization temperature to higher values.

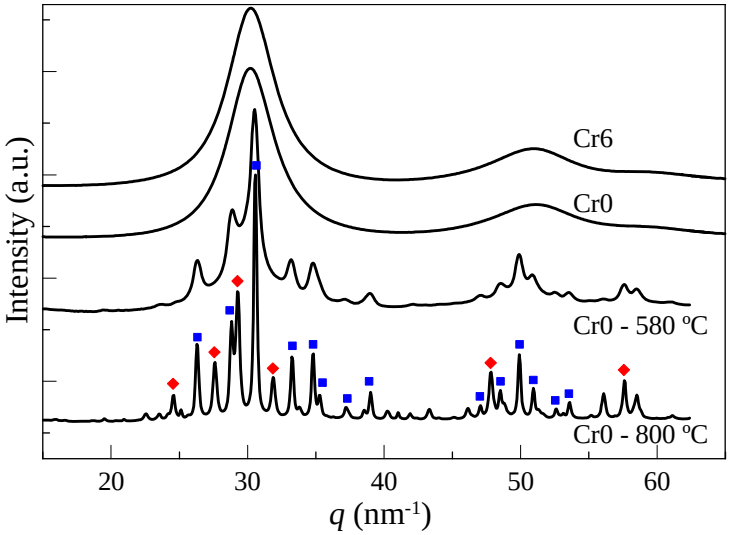

Figure 2

These results, combined with transmission electronic microscopy and corrosion tests have permitted to analyse the effect of the devitrification process in the corrosion resistance of this important family of amorphous steels. The results have been submitted to publication.