Investigation of the polymer interphases is an emerging field nowadays. In many cases interphases determine the functionality of a system. There is a great demand for exploration of fundamental understanding of the interphases and elucidation of their formation, dimensions dependent on various influencing factors, change of functional properties, etc. Porous glasses are particularly interesting materials as they can represent inverse nanocomposites, where the interconnected pores with dimensions of nanometer scale are filled with a reactive polymer. Furthermore, confined reactive polymers are able to react within the pores of porous glasses. This is of particular interest in the polymer research as the reaction kinetics may be strongly driven by the confined environment.

The epoxy resin system used in this experiment is applied on porous glass and penetrates its pores with an extent dependent on the pore size, temperature and epoxy components mixing ratio. Developed over the recent time challenging sample preparation procedure allowed to produce very smooth epoxy - porous glass cross-sections. It included formation of interphases, followed by production of cross-sections and their polishing: 1st step - manual, 2nd step - ion beam etching.

In this study, combined AFM - Raman microspectroscopy was used to investigate the epoxy-porous glass interphases. It allowed for morphological studies and chemical differentiation between different regions at the cross-section and determination of the degree of cure of epoxy system in the porous glass.

Acknowledgement: The present project is supported by the National Research Fund, Luxembourg