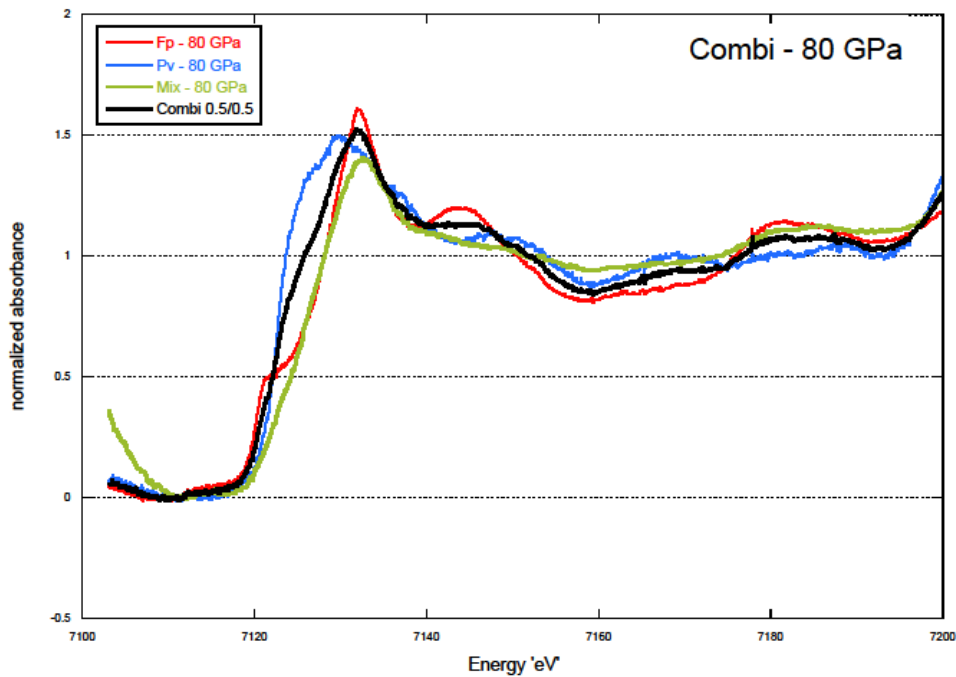


Report on Experiment # HS-3984

At the ID24 beamline, we performed XANES measurements at the Fe K-edge *in situ* in the diamond anvil cell (DAC) at pressures up to about 100 GPa. Laser heating was performed at each pressure in order to favor the thermodynamic equilibrium. In the following figure, we report features obtained for three different DAC-loadings at a similar pressure of ~80 GPa. They contained (i) pure (Mg,Fe)O ferropericlae (Fp, reported in red), (ii) pure Al-bearing (Mg,Fe)SiO₃ perovskite (Pv, reported in blue) and (iii) a mixture of the two components (green). We also calculated the profile expected for an equal Fe partition between both phases (black).



While the 50/50 theoretical mixture of phases (black) resembles vaguely to the experimental mixture of Pv-Fp, the data quality appears clearly insufficient to retrieve quantitative information about the Fe behavior in the Fp-Pv system. In fact, further refinements show that there is more than one solution to obtain the deconvolution of the mixed XANES patterns in terms of a sum of the patterns recorded for the two different compounds.

These measurements were performed before the recent upgrade of the ID24 beamline. Based on preliminary measurements, we believe that the upgrade apparatus can solve this problem.