

## X-ray Absorption Spectroscopy investigations of disordered matter

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The potential of x-ray absorption spectroscopy (XAS) for the investigation of disordered and ill-ordered systems is discussed, highlighting the unique XAS potential and its complementarity with more standard experimental techniques like x-ray and neutron diffraction. Some recent advances in instrumentation combining XAS, x-ray diffraction and other diagnostics, as well as new sample environment capabilities is described, showing that accurate experiments on highly disordered systems can be nowadays performed under high-pressure and high-temperature conditions [1-3]. The sensitivity of XAS to phase transitions through single-energy temperature-scanning experiments will be also discussed showing that metastable disordered systems like for example deeply undercooled liquids can be measured and analysed[4].

Moreover, advances in data-analysis approaches including ab-initio multiple-scattering calculations combined with diffraction experiments or Molecular Dynamics are presented. The importance of using model-independent approaches like Reverse Monte Carlo modelling is also discussed along with specific examples[4,5]. Finally, some of the most interesting achievements in the application of XAS to disordered systems are reviewed from a personal perspective, including liquids (also in metastable deeply undercooled states) and glasses under extreme conditions [4,6-8].

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