A laser heating facility for energy-dispersive X-ray absorption spectroscopy

A double-sided laser heating setup for diamond anvil cells installed on the ID24 beamline of the ESRF is presented here. The setup geometry is specially adopted for the needs of energy-dispersive X-ray absorption spectroscopic (XAS) studies of materials under extreme pressure and temperature conditions. We illustrate the performance of the facility with a study on metallic nickel at 60 GPa. The XAS data provide the temperature of the melting onset and quantitative information on the structural parameters of the first coordination shell in the hot solid up to melting.

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