



## A Combinatory Package for Diamond Anvil Cell Experiments

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The X-ray diffraction (XRD) of the sample was performed on a Rigaku Ultima VI (3KW) diffractometer using Cu K $\alpha$  radiation generated at 40 kV and 40 mA. The X-ray diffraction data were collected with a scanning rate of 10° per minute and a scanning step length of 0.01° The sample surface was covered with Mylar (there is no diffraction peaks for the covered materials) to protect sample from degradation in air. Figure S1 shows (XRD) patterns of our samples at ambient pressure. One can distinguish two phases of La corresponding to the ambient  $\alpha$ La phase& the low pressure metastable  $\beta$ La, respectively. In addition to the La metal phases there is also the La<sub>2</sub>O<sub>3</sub> phase that is hardly to avoid during manipulate the samples since La is very easy to oxidase. However is La<sub>2</sub>O<sub>3</sub> highly insulate so it will not contribute to the electric conductivity measure measurements.



**Figure S1.** The XRD patterns of the samples at ambient pressure wherein the upper is the diffraction from the specimen while the lower are the standard patterns from  $\alpha La_{\beta}$   $\beta La \& La2O3$ , respectively.