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Fabrication and Application of TEM-compatible Sample Grids for *ex situ* Electrical Probing

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Memristors are promising candidates for new memory technologies and are capable to mimic neural networks. The switching in memristive devices occurs typically in few nanometer thin oxide layers. The direct observation of the switching mechanism is crucial for better comprehension and improvements of memristors. Therefore, *in situ* experiments are conducted in a transmission electron microscope (TEM). However, electron beam irradiation can lead to a chemical modification of the active layers. Moreover, devices may show different performance due to the details of processing parameters. Thus, it is essential to characterize memristors electrically before microstructural analysis. In this work a TEM compatible grid is developed, which can be used for *ex situ* electrical probing and TEM investigations. Different techniques for the production, like shadowing and lithography are compared with their advantages and drawbacks.