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Transport properties of high-quality reduced graphene oxide M. ENZELBERGER, Lehrstuhl für Experimentalphysik, Universität Erlangen, S. EIGLER, Department of Chemistry and Pharmacy, and Institute of Advanced Materials and Processes (ZMP), Universität Erlangen, P. HOFFMANN, Lehrstuhl für Experimentalphysik, Universität Erlangen, S. GRIMM, A. HIRSCH, Department of Chemistry and Pharmacy, and Institute of Advanced Materials and Processes (ZMP), Universität Erlangen, P. MÜLLER, Lehrstuhl für Experimentalphysik, Universität Erlangen — Chemical production of graphene, especially reducing graphene oxide has gained a lot of interest in recent years. Yet the transport properties of such materials are usually not comparable to those of graphene. We have found a way to overcome this problem using a modification of the standard Hummer's method. Single flakes of reduced graphene oxide have been investigated. The graphene oxide was deposited onto a SiO₂/Si substrate and subsequently reduced using hydrogen iodine. The resulting reduced graphene oxide samples were patterned by electron beam lithography. We have characterized the quality of the samples by combining Raman spectroscopy and Hall mobility measurements in magnetic fields up to 14 T and temperatures down to 0.3 K. High-quality samples had a Raman D/G ratio of better than 1 and showed Hall mobilities exceeding 1000 cm²/Vs. This is nearly two orders of magnitude higher than what is known for standard reduced graphene oxide. The best samples even show Shubnikov-de Haas oscillations and Hall plateaus. S. Eigler, Christoph Dotzer, Andreas Hirsch, Michael Enzelberger, Paul Müller, *Chem. Mater.*, **24** 1276 (2012)

Michael Enzelberger
Lehrstuhl für Experimentalphysik, University of Erlangen

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