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Transport and magnetic properties of rare-earth nitrides JOE TRODAHL, SIMON GRANVILLE, BEN RUCK, FELIX BUDDE, Victoria University of Wellington, Wellington, New Zealand, TONY BITTAR, GRANT WILLIAMS, Industrial Research Ltd., Lower Hutt, New Zealand — There is controversy about the conducting character of the rare-earth nitrides, with reports existing from metallic to moderately wide band-gap semiconductors. In a programme intended to clarify that issue we have grown thin films of the rare-earth mononitrides GdN, SmN, DyN and ErN by ion assisted deposition (IAD). Their stoichiometry and nanocrystalline structure have been characterised by RBS, SIMS, XRD, TEM, and EXAFS. The as-prepared materials are very reactive in the atmosphere, but they are effectively passivated by capping layers of either MgF₂ or IAD GaN. Their magnetic properties have been studied from ambient temperature to 5 K and found to be in agreement with reported behaviour in the literature. The conductivity is typical of semiconductors, as regards both its magnitude and its temperature dependence.

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