Long-Term Stability and Optoelectronic Performance Enhancement of InAsP Nanowires with an Ultra-Thin InP Passivation Layer

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Supporting Information:

Figure S1. Photoconductivity decays of InAs nanowires of different diameters of 40, 55, 70 and 172 nm on a semilogarithmic scale fitted with lifetimes of $\tau = 120, 135, 230$ and 505 ps respectively. The black lines are monoexponential fits to the decay.

Figure S1 plots photoconductivity decay curves obtained from InAs nanowires of different diameters. These data were obtained by optical pump–terahertz probe spectroscopy as described in the main manuscript. Charge carrier lifetimes $\tau$ were extracted by fitting monoexponential decays to the data. By fitting Equation (1) (main manuscript) to the charge carrier lifetimes $\tau$ as a function of diameter $d$, a surface recombination velocity $S_{\text{InAs}}$ value of $8.7 \times 10^3$ cm/s is obtained which is the same order of magnitude as that in previous reports.1

References:

(1) Joyce, H. J.; Docherty, C. J.; Gao, Q.; Tan, H. H.; Jagadish, C.; Lloyd-Hughes, J.; Herz, L. M.; Johnston, M. B. Electronic Properties of GaAs, InAs and InP Nanowires Studied by Terahertz Spectroscopy. Nanotechnology 2013, 24 (21), 214006. 
https://doi.org/10.1088/0957-4484/24/21/214006.