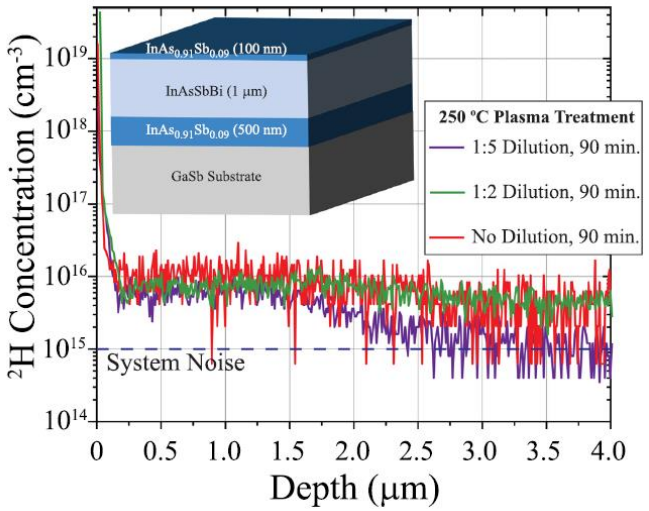

FIG. 1. Secondary ion mass spectrometry depth profile of deuterium in samples plasma treated at 250 °C for 90 min with hydrogen:argon dilution ratios of 1:5 (violet line) and 1:2 (green line), as well as for treatment with undiluted hydrogen (red line). Inset shows the layer stack of the InAsSbBi sample investigated in this work.

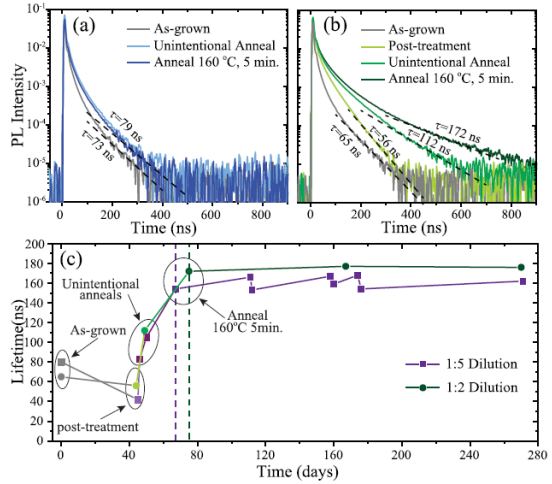

FIG. 2. (a) TRPL scans and extracted minority carrier lifetimes from a control sample showing no effective change in lifetime with anneal (both unintentional and controlled). (b) TRPL scans and extracted minority carrier lifetimes from hydrogenated (1:2 dilution) and annealed sample. Hydrogenation produced a slight decrease in lifetime, but significant extension of lifetime was observed upon a short (5 min), low temperature (160 °C) anneal. (c) Minority carrier lifetimes extracted pre- and post-hydrogenation and anneal over days for samples treated with 1:2 (green) and 1:5 (violet) hydrogen:argon dilution.

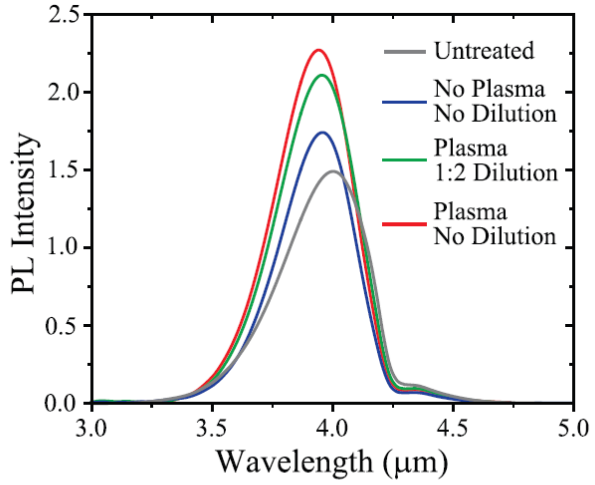

FIG. 4. Photoluminescence spectra of InAsSbBi for four different samples, in order of increasing PL intensity: untreated (gray), hydrogenated with no plasma and no dilution (blue), plasma-treated (with 1:2 dilution) (green), and plasma-treated with no dilution (red). All samples were annealed at low temperature (160 °C). The sample plasma-treated in undiluted hydrogen showed the strongest PL intensity (as well as the longest minority carrier lifetime as seen in Fig. 3).

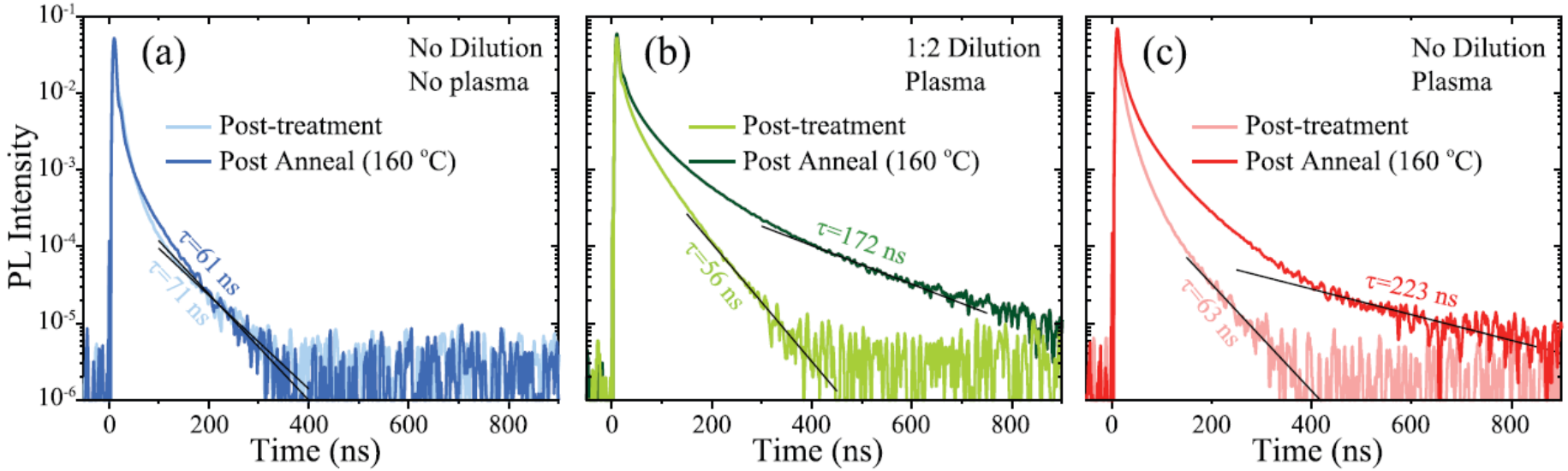

FIG. 3. TRPL signal and extracted minority carrier lifetime (i) post-hydrogenation and (ii) post hydrogenation + low temperature anneal for (a) undiluted hydrogen gas with no hydrogen plasma present, (b) diluted (1:2) hydrogen gas with hydrogen plasma present, and (c) no hydrogen gas dilution with hydrogen plasma present.