Plasmon spectroscopy of anisotropic gold nanoclusters on GaAs(001) surface passivated by sulphur atoms

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This work demonstrates how to create the structures Au/GaAs with perfect on-surface gold nanoclusters. In doing so, used is covering the GaAs substrate with chemically stable atomic monolayers of sulphur to prevent subsequently a chemical reaction of Au with GaAs. The structures Au/S/GaAs with monolayers of chemisorbed sulphur atoms are fabricated, characterized and studied by polarized reflection spectroscopy. The anisotropy of on-surface gold nanoclusters is established, and the anisotropic plasmons localized in Au clusters are investigated using the spectra of polarized reflection and interpreted theoretically.

Keywords: sulphide passivation, gold nanoclusters, plasmon anisotropy, polarized reflectance.

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