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Nuclear magnetic dipole moments of As and Sb isotopes from ab initio NMR shielding calculations and NMR experiments

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Accurate NMR shielding constants for arsenic (As) and antimony (Sb) in the AsF_6^- , AsO_4^{3-} , SbCl_6^- , and SbF_6^- complexes were calculated using both non-relativistic coupled cluster methods and relativistic four-component density functional theory (DFT). The magnetic dipole moments of the ^{75}As , ^{121}Sb , and ^{123}Sb nuclei were redetermined, leading to revised recommended reference values. The updated nuclear magnetic dipole moments are $\mu(^{75}\text{As}) = 1.43711(4) \mu_N$, $\mu(^{121}\text{Sb}) = 3.35540(33) \mu_N$, and $\mu(^{123}\text{Sb}) = 2.54389(25) \mu_N$, correcting previous systematic errors of up to $0.008 \mu_N$ in earlier reference data. These magnetic dipole moments provide reliable references in nuclear physics, becoming the reference for magnetic moments in isotopic series of radioactive/exotic nuclei.

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