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The ionic dipole and quadrupole polarizabilities of magnesium

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The non-adiabatic core polarization is used to analyze the measured microwave transitions (B. J. Lyons and T. F. Gallagher, Phys. Rev. A 57, 2426 (1998)) to determine the Mg^+ $3s$ dipole and quadrupole polarizabilities. From the calculation, the values of the Mg^+ $3s$ dipole and quadrupole polarizabilities are 34.85(23) a_0^3 and 78(20) a_0^5, respectively.

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