



Isotope Shifts in Atomic Spectra (Physics of Atoms and Molecules)

By *W.H. King*

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Atomic and nuclear physics are two flourishing but distinct branches of physics; the subject of isotope shifts in atomic spectra is one of the few that links these two branches. It is a subject that has been studied for well over fifty years, but interest in the subject, far from flagging, has been stimulated in recent years. Fast computers have enabled theoreticians to evaluate the properties of many-electron atoms, and laser spectroscopy has made it possible to measure isotope shifts in the previously unmeasurable areas of very rare isotopes, short-lived radioactive isotopes, weak transitions, and transitions involving high-lying atomic levels. Isotope shifts can now be measured with greater accuracy than before in both optical transitions and x-ray transitions of muonic atoms; this improved accuracy is revealing new facets of the subject. I am very grateful to Dr. H. G. Kuhn, F. R. S., for having introduced me to the subject in the 1950s, and for supervising my efforts to measure isotope shifts in the spectrum of ruthenium. I thus approach the subject as an experimental atomic spectroscopist. This bias is obviously apparent in my use of the spectroscopist's notation of lower-upper for a transition, rather than the nuclear physicist's upper-lower. My reasons are given in Section 1.3 and I hope that nuclear physicists will forgive me for using this notation even for muonic x-ray transitions.

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