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This Week's Citation Classic ®

Moore C E. *Atomic energy levels as derived from the analyses of optical spectra.* National Bureau of Standards Circular 467. Washington, DC: US Government Printing Office. Vol. I, 1949; Vol. II, 1956; Vol. III, 1958. (Reprinted: National Standard Reference Data Series-National Bureau of Standards (US) 35, 1971.)
[National Bureau of Standards, Washington, DC]

This series of three volumes is a critical compilation of atomic energy levels prepared at the National Bureau of Standards from the analyses of optical spectra. Volume I contains data on the spectra of ^{1}H to ^{23}V. Volume II covers the spectra of ^{24}Cr to ^{41}Nb. Volume III includes the spectra of ^{42}Mo to ^{57}La and ^{72}Hf to ^{89}Ac. [The *SCI*® indicates that these volumes, including reprints, have been cited in more than 7,900 publications.]

Reference Data of Atomic Spectroscopy

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Dr. Charlotte Moore Sitterly's work on the tables of atomic energy levels had its roots in her astrophysical studies, especially on the solar spectrum (see references 1 and 2), which date back to the 1920s. During this work she recognized the need for comprehensive tables of atomic reference data to facilitate the analysis of astrophysical spectra. After compiling "Multiplet tables of astrophysical interest" at Princeton Observatory[3] in the 1930s, she came to the National Bureau of Standards in 1945 to compile other spectroscopic tables such as *An Ultraviolet Multiplet Table*,[4] and, especially, tables of atomic energy levels. She went about the preparation of these tables in a very active and dedicated manner, quickly establishing contacts with spectroscopy groups throughout the world in order to be able to include any relevant unpublished high-quality material so that the tables would be as comprehensive and inclusive as possible. She also surveyed the scientific community with an extensive and thorough questionnaire to determine the optimum format for the presentation of these spectroscopic data. Knowing that this would be a long-term project, she convinced the most appropriate spectroscopists to provide data for important gaps in the tables while she was already assembling the available material.

In critically evaluating the data, she sought the advice and help of the best qualified spectroscopists, beginning with the then chief of the bureau's Spectroscopy Section, William F. Meggers. Her three volumes of *Atomic Energy Levels* published in the years 1949-1958 and reissued in 1971 have indeed been so complete and so thoroughly prepared in a highly informative, clearly laid out format that they still constitute a widely used source for spectroscopists, astrophysicists, spectrochemists, etc. They have certainly been the definitive reference work on atomic structure data for several decades. Without the convenient availability of these data, the development of gas laser systems, for example, would not have proceeded so quickly. Even now, the tables are so well known that they are still often quoted for spectra where new reference compilations (see, for example, reference 5) have been done by the National Institute of Standards and Technology (formerly the National Bureau of Standards) on the basis of more recent material.

Dr. Moore Sitterly died on March 3, 1990, after having dedicated more than 50 years of her life to the critical compilation of spectroscopic reference data and thus establishing a database on which many findings and developments in various fields of physics and astrophysics rest.

1. **Moore C E.** Atomic spectra for the astrophysicist. *Science* 113:669-73, 1951.
2. -------. Atoms and ions in the sun. *Science* 119:449-56, 1954.
3. -------. Multiplet tables of astrophysical interest. *Contrib. Princeton Univ. Observatory* (20), 1945. (Cited 360 times.)
4. -------. *An ultraviolet multiplet table.* National Bureau of Standards Circular 488. Washington, DC: US Government Printing Office. Sec. 1, 1950; Sec. 2, 1952; Secs. 3, 4, 5, 1962. (Cited 15 times.)
5. **Sugar J & Corliss C.** Atomic energy levels of the iron-period elements: potassium through nickel. *J. Phys. Chem. Ref. Data* 14(Suppl.2), 1985. 664 p. (Cited 70 times.)

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