

## This Week's Citation Classic<sup>®</sup>

Lever A B P. *Inorganic electronic spectroscopy*. Amsterdam, The Netherlands: Elsevier, 1968. 420 p.  
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This book, published at a time when there was explosive growth in our understanding of inorganic complex chemistry, provided the first introduction to inorganic electronic spectroscopy at a level suitable both for graduates and undergraduates. It became essential reading for anyone entering the field. [The SC<sup>®</sup> indicates that this book has been cited in more than 2,315 publications.]

### Comprehensible Electronic Structure

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Modern inorganic electronic spectroscopy began in the early 1950s. By the middle 1960s, simple crystal field theory had adequately demonstrated its ability to rationalize a large amount of electronic d-d spectroscopic information. The theory was flawed but most of its predictive capacity was embedded in the geometry of the complex. The data were used to define the structural geometry of these complexes, but the more subtle electronic structural information was generally not extracted.

Some seminal books appeared at this time, especially C.K. Jorgensen's classic<sup>1</sup> and the more mathematically oriented book by D.S. McClure.<sup>2</sup> Ligand field theory was also growing in importance as an attempt to overcome some of the deficiencies of the simple crystal field model. A series of theoretical texts appeared in the early 1960s—especially those of C.J. Ballhausen,<sup>3</sup> B.N. Figgis,<sup>4</sup> and the extraordinary contribution from J.S. Griffith<sup>5</sup>—all addressing these theories but at an advanced graduate level largely incomprehensible

to all but the most sophisticated undergraduate.

There was clearly a need for a simple introductory text covering the then current knowledge but presented in a way that the average senior undergraduate could readily appreciate. Such a book should then stimulate the teaching of the field to younger minds. This then was the aim of the first edition of *Inorganic Electronic Spectroscopy (IES)*.

At that time, F.A. Cotton's book on group theory<sup>6</sup> had opened the doorway into this elegant field for inorganic chemists, but the theory had hardly appeared in the undergraduate curricula. For this reason, a chapter on group theory was contained within *IES*. Together with atomic theory, these fundamental chapters paved the way to understand the electronic spectroscopy that followed. Thus the book, which owed a lot to the earlier treatments by Griffith, Ballhausen, Jorgensen, and Figgis, was self-contained.

The work was written over a period of about three years with an extensive collection of file cards, using an old Olympic typewriter (in an English "centrally heated" house where the winter temperature in the den often dropped to 45° F). This is in contradistinction to the second edition of this work,<sup>7</sup> produced (warmly) with a word processor using data mostly stored on disks.

It is gratifying in the extreme to reflect that so many generations of undergraduate and graduate students obtained their first exposure to electronic spectroscopy through this book. Indeed the book retains its uniqueness since no other book with this focus and content has ever appeared. The second edition is written at a somewhat higher level appropriate for the more sophisticated undergraduates of the 1980s and 1990s. However the emphases of the two editions are sufficiently different that both have a pedagogical role to play.

1. Jorgensen C K. *Absorption spectra and chemical bonding in complexes*. Oxford, England: Pergamon, 1962. (Cited 995 times.)
2. McClure D S. *Electronic spectra of molecules and ions in crystals*. New York: Academic Press, 1959.
3. Ballhausen C J. *Introduction to ligand field theory*. New York: McGraw Hill, 1962. (Cited 2,060 times.)
4. Figgis B N. *Introduction to ligand fields*. New York: Wiley Interscience, 1966. (Cited 540 times.)
5. Griffith J S. *Theory of transition metal ions*. Cambridge, England: Cambridge University Press, 1964. (Cited 280 times.)
6. Cotton F A. *Chemical applications of group theory*. New York: Wiley Interscience, 1963. (Cited 260 times.)
7. Lever A B P. *Inorganic electronic spectroscopy*. Amsterdam, The Netherlands: Elsevier, 1984. (Cited 350 times.)

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