Book Reviews

Annual Survey of Photochemistry. (Volume 1: Survey of 1967 Literature). N. J. Turro, G. S. Hammond, J. N. Pitts, Jr., and D. Valentine, Jr. Wiley-Interscience 1969, Pp xiii+588. Price 190 s.

This book is comprised of the following four parts: Part 1: Synthetic Organic Photochemistry (202 pages, 674 refs.) by N. J. Turro; Part 2: Physical Organic Photochemistry (101 pages, 365 refs.) by W. B. Hammond and G. S. Hammond; Part 3: Photochemistry of Gases (90 pages, 364 refs.) by A. D. Broadbent, J. N. Pitts, Jr., and E. Whittle; Part 4: Progress in the Study of Inorganic and Organometallic Spectroscopy and Photochemistry (81 pages, 386 refs.) by D. Valentine, Jr. Owing to the inorganic character of the present journal, our review will only deal with Part 4 of the book.

As stated in its preface, this book is the first one of a series whose aim is to present a summary of progress in certain areas of photochemistry published over a year's time. Such a careful definition of the time period for coverage should eliminate some of the « unfortunate characteristics of reviews », namely « lack of comprehensive coverage, failure to define adequately the scope of the material covered, and noncritical compilation of material ». However, if one has to pass judgment on the basis of Part 4 alone, the book does not fulfil completely these expectations. Moreover, the reader should note that this part of the book unfortunately presents many errors which seriously limit its utility. In fact, I have found as many as 169 mistakes which may be subdivided as follows: 28 serious mistakes or misinterpretations of original papers; 44 errors concerning the references quoted in the text; 33 minor oversights of various types; 36 errors which presumably are misprints; 28 errors of various kinds in the final reference list. The following examples are representative.

— p. 463-464: Fig. 1 should show the « absorption and luminescence spectra of $Cr(tn)_3^{3+}$ ». In realiyt, only a minor portion of absorption spectrum of this complex is shown in the figure (namely, only the « doubled » band). Moreover, the figure was not taken from ref. 30, as stated in its legend, but from a paper of G. B. Porter and H. L. Schläfer, *Z. physik. Chem.* (Frankfurt), *38*, 227 (1963). Note also that the curve on the right-hand side of the phosphorescence spectrum should be labeled « X 10 » (see the original figure). Finally, the original figure has been wrongly modified by the placing of two zeroes at the beginning of the wavenumber scales on positions that really correspond to 14000 and 16000 cm^{-1}, respectively.

— In Figure 10 there is at least 7 imperfections or printing errors.

— p. 468: Figure 3, which should illustrate the dependence of the type of luminescence of Cr^{III} complexes upon the ligand field strength, does not correspond to the original figure (which is not in ref. 38, as stated in the legend, but in ref. 39). In fact, the absorption and emission spectra, as they are reported in Figure 3, do not have any significance and their relation with ΔE does not appear. Moreover, label $^4T_2$ (which is wrongly printed) is on the curve of the doublet state instead of on the curve of the quartet state.

— p. 471: Refs. 388 and 389, quoted in the tenth line from below, do not appear in the reference list which, in fact, ends with ref. 386.

— p. 472, lines 9 to 24: in the discussion on the $Cr(NH_3)_{6-x}(H_2O)_x^{3+}$ complexes, the authors seems to ignore that H_2O photoexchange can also occur in addition to NH_3 photoaquation. Thus, the conclusions drawn from the trend of this last reaction alone can be misleading, as already pointed out by Adamson (*J. Chem. Phys., 71,* 798 (1967)). For the same complexes, it is also claimed that « ... apparent activation energies for photochemical ligand exchange vary directly as x ». Actually, the only data available on this matter are as follows: the apparent activation energy of NH_3 aquation is about zero for x = 0-4, and the apparent activation energy of H_2O exchange is about 13 kcal/mole for $Cr(H_2O)_6^{3+}$.

— p. 474-475: The spectrum of $Co(NH_3)_5Br^{2+}$, reported in Figure 8, is completely different from the true spectrum of this complex. The figure also shows two evident printing-errors. Moreover, the band attributions given for this complex on p. 475 is confusing. It is well known, in fact, that both the high intensity bands observed in the u.v. region of the spectrum are due to Br→Co transitions.

— p. 480, Table III: This table, which concerns the photochemistry of some Co^{III} complexes, was badly copied from the original paper (ref. 58). For example, the aquation and redox quantum yields are indicated with the same symbol so that one cannot realize which is which. Moreover, the author forgot to copy the labels which individualized the five footnotes, and also forgot to insert these labels in the body of the table.

— p. 489: Figures 11 a and 11 b do not correspond to the original figures reported in ref. 101 from which such figures are said to be taken. It follows that the intramolecular twisting mechanism for *cis-trans* isomerization of PtX_2L_2 complexes cannot be clearly understood from the few sentences which comment the two figures. Note also that Figures 11 a and 11 b are perfectly identical and that, according to Figure 11 a, PtX_4 complexes should exhibit geometrical isomerism!

— p. 501-506: Two different reactions, one on p. 501 and the other on p. 502 are labeled with the same number (*viz.*, 55). Moreover, between the « second » reaction 55 and reaction 56 there is a reaction labeled 61. Finally, another reaction 61 is given on p. 506. This confusion causes serious troubles to the reader.

— p. 503-505, Table IV: The references given in lines 1, 2, 8, 9, 17, 23 and 24 are wrong, and those given in lines 4, 10, 12 and 19 are partly wrong (the lines are counted on the reference column). In line 3, *p*—$CH_3C_6H_4$ should be replaced by *p*—FC_6H_4. In line 16, the product is missing. In the last line, the formula of the metal carbonyl contains six printing errors. Furthermore, footnotes *j*, *l*, and *t* contain several oversights, and footnotes *b* and *i* are missing in the body of the table.

— p. 514, line 3 from below: « ... a limiting quantum yield of 1.0 for production of N_2 was observed, suggesting that the quantum yield for production of solvated electrons was 0.5 ». The last part of the sentence is wrong since $\Phi=1$ for N_2 production coresponds to $\Phi=1$ for solvated electron production.

— p. 543, ref. 83: This reference is the same as ref. 61 except that here the authors names have been (erroneously) put in the reverse order.

— p. 548, ref. 207: This reference is the same as ref. 100 except that here the page number is wrong (1589 instead of 2589).

The attempt to provide those interested in photochemistry with an annual comprehensive survey of the chemical literature is certainly commendable. In compliance with the authors' request for helpful suggestions, I would like to recommend that the inorganic photochemistry be treated in a more correct and appropriate way in the future volumes of this series.

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