

Two Surveys of Physical Chemistry Textbook Adoptions

J. Edmund White

Southern Illinois University at Edwardsville, Edwardsville, IL 62026

In 1983, planning was begun for a problem-solving book to supplement textbooks for the standard university course in physical chemistry.¹ The publisher wished to correlate the new book with the most widely used textbooks, so a brief questionnaire was sent to professors of physical chemistry asking which textbook was used currently and which probably would be used the following year. In 1986, as completion of the book approached, a second survey was made. The results of both surveys are reported.

Only general conclusions are drawn; the small number of contacts does not justify detailed analysis. No interpretation is attempted of differences of a few percent between different textbooks, and no attempt is made to analyze why one book or author is more popular than another. Such considerations are beyond the scope of the data collected.

Selection and Polling of Institutions

The institutions to be polled were chosen from the list, "Student Affiliate Chapters and Local Sections, October 1982", provided by the Education Division of the American Chemical Society. Because they probably do not offer a one-year physical chemistry course, community colleges were deleted, leaving 589 institutions with active student affiliate chapters. The primary selection guideline was to choose one public and one private institution from each state plus the District of Columbia and Puerto Rico, but it had to be violated. In three cases, there was only one eligible institution and, in one case, none. Also, for a few of the less-populated states, only one institution was chosen. Other guidelines were to include some large and some small institutions, some rural and some metropolitan locations, some traditionally black, and some traditionally female.

Selections from the list were made by the author arbitrarily, so they reflect whatever bias or misinformation he may have had. The approximately 100 names obtained in the first run were expanded to 120 to include more institutions from the more populous states and to satisfy better the secondary guidelines. These 120 institutions were polled by mail. Finally, six local institutions were reached by personal contact, to

give a total of 126. Inadvertently, four institutions with inactive chapters were included. Thus, the 126 were taken from a list of 593, a sample of 21.2%. The same sample was used for both surveys.

A short explanatory letter and a preaddressed, stamped postcard were sent by first-class mail to the 120 departments of chemistry. The back of the card was printed so that little writing was required. It asked for the "textbook used for the physical chemistry course required of our undergraduate chemistry majors" in the current year and the probable one to be used for the next year. The 1983 card asked for the book used two years before, but the responses were ambiguous and were not used.

Results

The response rate for 1983 was 71% (89/125) (only 125 contacts because one letter was returned). In 1986, it was 85% (107/126). Seventy-eight (62%) responded both times.

The 1983 results are in Tables 1 and 2, and those for 1986 are in Tables 3 and 4. In the first columns, textbooks are identified by author(s) and edition (if there is more than one).² The second columns of Tables 1 and 3 give the number using that book in the year of the survey, while the third columns express this number as a percent of total responses, e.g., from Table 1, five departments used Adamson (6% of the 89 responses). (Percents are rounded to whole numbers; greater precision is unwarranted.) In the fourth columns is the number who would use the same book (or new edition by same author) in the following year, while the fifth columns express this number as the percent of the current users of that book (author). From Table 1 again, three of the 1982-83 users of Adamson (60%) would continue to use it in 1983-84.

In Tables 2 and 4, the total use for the following year is projected. The second columns give the number of new adoptions of each book while the third columns express this number as a percent of all new adoptions. In the fourth columns is the sum of new adoptions and continuations (from Table 1 or 3); this sum is the projected number of users, expressed in the fifth columns as a percent of total users. Using Alberty as the example, in 1983-84, four would continue (Table 1) and two would adopt (Table 2), so a usage of six (7% of the 89 responses) is projected for 1983-84.

In Table 5, the uses (percents of total responses) for each year are collected for ease of comparison and interpretation. In Table 6 are the numbers of departments using the same author(s), disregarding edition, in each of the four years

Presented at 194th ACS National Meeting, New Orleans, LA, August 30-September 4, 1987.

¹ White, J. E. *Physical Chemistry, College Outline Series*; Harcourt Brace Jovanovich: San Diego, CA, 1987.

² The complete reference for each text mentioned in a table is given in the list of references.

Table 1. 1983 Survey

Texts Reported	Using in 1982-83		Continuing in 1983-84	
	Number	Percent of total responses	Number	Percent of 1982-83
Adamson (1st)	5	6	3	60
Alberty (5th)	9	10	4 (5th & 6th)	44
Atkins (2nd)	34	38	25	74
Barrow (4th)	7	8	3	43
Berry, Rice, and Ross	3	3	3	100
Bromberg (1st)	4	4	2	50
Castellan (2nd)	4	4	2	50
Laidler and Meiser	8	9	4	50
Lesk	2	2	0	0
Levine (1st)	6	7	3	50
Moore (4th)	6	7	4	67
Personal Notes	1	1	1	100
Total	89	99	54	61

Table 2. 1983 Survey

	Projected Use in 1983-84			
	New adoptions	Percent of all new adoptions	Adoptions plus continuing	Percent of total responses
Adamson (1st)	0	0	3	3
Alberty (5th and 6th)	2	6	6	7
Atkins (2nd)	0	0	25	28
Barrow (4th)	0	0	3	3
Berry, Rice, and Ross	0	0	3	3
Bromberg (1st)	0	0	2	2
Castellan (2nd)	1	3	3	3
Laidler and Meiser	3	9	7	8
Lesk	0	0	0	0
Levine (1st)	2	6	5	6
Moore (4th and Basic)	7	20	11	12
Personal Notes	1	3	2	2
Undecided	19	54	19	21
Total	35	101	89	98

covered by the two surveys. The third column expresses these numbers as a percent of the number using that author in 1982-83.

Discussion of Results

The short and simple questionnaire probably is the main reason for the gratifyingly large responses to both surveys. The greater response in 1986 may be partly due to interest aroused by the brief report, in the cover letter, of the 1983 results. The 29 new responders were partially offset, however, by the 11 who did not repeat.

In spite of any limitations or inadequacies of the survey, the validity of one conclusion seems unquestionable: one author (Atkins) has dominated the field for five years. See Table 5. Although the second edition lost ground in 1983-84 and in 1985-86, this was recovered in 1986-87 with the third edition. In all four years, second place must be considered a tossup between several authors. In 1982-83, six authors fall in the 6-10% range; in 1986-87, there are five in the 6-11% range, but only two of the six repeat.

The rise and fall in the adoptions of each author can be followed in Table 5. One factor probably contributing to the large number changing to Atkins's third edition is the attraction of any new edition. The same effect is seen in the large percent of adoptions of Moore (Basic) in 1983-84 (Table 2) and in the large increases in 1985-86 for Alberty (new 6th) and for Castellan (new 3rd) (Table 5). The new book by

Table 3. 1986 Survey

Texts Reported	Using in 1985-86		Continuing in 1986-87	
	Number	Percent of total responses	Number	Percent of 1985-86
Adamson (2nd)	2	2	2 (3rd)	100
Alberty (6th)	16	15	6	38
Atkins (2nd)	27	25	25 (3rd)	93
Barrow (4th)	5	5	5	100
Bromberg (2nd)	7	6	4	57
Castellan (3rd)	15	14	11	73
Laidler and Meiser	5	5	5	100
Levine (2nd)	7	6	6	86
Moore (Basic)	5	5	2	40
Noggle	10	9	5	50
Other (only one user)	8	8	3	38
Total	107	100	74	68

Table 4. 1986 Survey

	Projected Use in 1986-87			
	New adoptions	Percent of all new adoptions	Adoptions plus continuing	Percent of total responses
Adamson (3rd)	2	6	4	4
Alberty (6th)	1	3	7	6
Atkins (3rd)	12	36	37	35
Barrow (4th)	0	0	5	5
Bromberg (2nd)	2	6	6	6
Castellan (3rd)	1	3	12	11
Laidler and Meiser	0	0	5	5
Levine (2nd)	4	12	10	9
Moore (Basic)	1	3	3	3
Noggle	3	9	8	7
Other (only one user)	2	6	5	5
Undecided	5	15	5	5
Total	33	99	107	101

Table 5. Summary of Use by Year

	(as Percent of Total Responses)			
	1982-83	1983-84	1985-86	1986-87
Adamson	6	3	2	4
Alberty	10	7	15	6
Atkins	38	28	25	35
Barrow	8	3	5	5
Berry, Rice, and Ross	3	3	0	0
Bromberg	4	2	6	6
Castellan	4	3	14	11
Laidler and Meiser	9	8	5	5
Lesk	2	0	0	0
Levine	7	6	6	9
Moore	7	12	5	3
Noggle	...	...	9	7
Personal Notes	1	2	...	...
Other (only one user)	...	...	8	5
Undecided	...	21	...	5
Total	99	98	100	101

Noggle also garnered a substantial percent in 1985-86 (Table 3). The percents for these authors declined in 1986-87, however, as a result of the appreciable increase for Atkins' new edition (Table 5).

The percents in the fifth columns of Tables 1 and 3 could be dubbed "continuity rates"; they show the extent to which

Table 6. Number Using Same Author in All Four Years^a

	Number	Percent of 1982–1983 ^a
Adamson	1	20
Alberty	2	22
Atkins	13	38
Barrow	2	29
Berry, Rice, and Ross	0	0
Bromberg	0	0
Castellan	1	25
Laidler and Meiser	3	38
Lesk	0	0
Levine	1	17
Moore	0	0
Personal Notes	1	100
Total	24	31 ^a

^a Based on 78 who responded to both surveys.

a textbook (or author) is retained for the following year. In most cases, half or more of the users continue with the same book (or author). Between 1982–1983 and 1983–1984 (Table 1), 54 of 89 (61%) kept the same book; between 1985–1986 and 1986–1987 (Table 3), it was 74 of 107 (68%). From the opposite viewpoint: in a given year, the textbook will be changed in about one-third of the courses.

From Table 6 comes an indication of long-term loyalty: using the same author for five years. There are no data for 1984–1985, so it is possible that some of the 24 long-time users changed to another author that year and back in 1985–1986, but that seems unlikely. It seems safe to assert that the same author has been retained for five years in about 30% of the departments responding.

Summary and Concluding Remarks

The results of the two surveys, collected in Table 5, can be summarized as follows:

1. The second and third editions of the physical chemistry textbook by Atkins have been used by 25–38% of the responding chemistry departments in the four years surveyed, and

2. several other authors have held significant, and approximately equal, percents of the market, but none has exceeded 15%.

Three general patterns evident in the results have been pointed out above:

1. As probably would have been predicted, a new edition or a new book brings, in its first year or two, an appreciable increase in usage for an author,

2. each year, the author is changed in about one-third of the physical chemistry courses, and

3. which perhaps would not have been predicted, in about 30% of the courses, the author is not changed over a five-year period.

These specific results and general patterns may be helpful to professors who are choosing textbooks and to authors and publishers who are contemplating new books or new editions. Regardless of that possibility, they do provide a picture of the use of physical chemistry textbooks in a cross section of those colleges and universities that have active ACS student affiliate chapters.

Acknowledgment

The first survey was financed largely by Harcourt Brace Jovanovich, Publishers; for the second, some help was provided by the Department of Chemistry, SIUE. In addition to thanks to both of them, thanks are extended to the 118 colleagues who responded to one or both of the requests for information.

References

- Adamson, A. W. *A Textbook of Physical Chemistry*, 2nd ed.; Academic: New York, 1979; 3rd ed., 1986.
- Alberty, R. A. *Physical Chemistry*, 5th ed.; Wiley: New York, 1980; 6th ed., 1983.
- Atkins, P. W. *Physical Chemistry*, 2nd ed.; Freeman: San Francisco, 1982; 3rd ed., 1986.
- Barrow, G. M. *Physical Chemistry*, 4th ed.; McGraw-Hill: New York, 1961.
- Berry, R. S.; Rice, S. A.; Ross, J. *Physical Chemistry*; Wiley: New York, 1980.
- Bromberg, J. P. *Physical Chemistry*; Allyn and Bacon: Boston, 1980.
- Castellan, G. W. *Physical Chemistry*, 2nd ed.; Addison-Wesley: Reading, MA, 1971; 3rd ed., 1983.
- Laidler, K. J.; Meiser, J. H. *Physical Chemistry*; Benjamin/Cummings: Menlo Park, CA, 1982.
- Lesk, A. M. *Introduction to Physical Chemistry*; Prentice-Hall: Englewood Cliffs, NJ, 1982.
- Levine, I. N. *Physical Chemistry*; McGraw-Hill: New York, 1978; 2nd ed., 1983.
- Moore, W. J. *Physical Chemistry*, 4th ed.; Prentice-Hall: Englewood Cliffs, NJ, 1972.
- Moore, W. J. *Basic Physical Chemistry*; Prentice-Hall: Englewood Cliffs, NJ, 1983.
- Noggle, J. H. *Physical Chemistry*; Little, Brown: Boston, 1985.