

Saint Paul MACTLAC Meeting

ROLE OF ANALYTICAL CHEMISTRY IN THE FOUR-YEAR CURRICULUM
DISCUSSION GROUP REPORT

Between 20 and 25 people attended this discussion, and we attacked the problem by attempting to define analytical chemistry. We concluded that analytical chemistry is the science devoted to exact and dependable measurements of constituents. Various possible approaches to the teaching of analytical chemistry as presented at the Atlantic City ACS meeting⁽¹⁾ were reviewed. The almost unanimous feeling of the Bucknell conferees⁽²⁾ that elementary analytical chemistry could be redistributed among general, organic and physical was reported by the discussion leader. The Bucknell conferees' insistence on an upper level course (after Physical) devoted to analytical chemistry was also noted.

Reference was also made to the article by Art Campbell in Chemical & Engineering News⁽³⁾ and the ensuing rebuttals in "Letters to the Editor."⁽⁴⁾ After a list of topics comprising the essentials of analytical chemistry was prepared, an attempt was made to determine the direction the majority of the group wished to move. A show of hands gave the following:

| | | |
|--|---|----|
| For redistributing elementary analytical | - | 11 |
| For 1 year of elementary analytical | - | 0 |
| For 1 semester of elementary analytical | - | 12 |

Since the group was evenly divided, the topics were discussed and tentative placement in the curriculum was made, either in (a) the first and second years, (b) physical, (c) organic or (d) advanced analytical.

Without specifying whether the first year course is called General Chemistry, Physical, Analytical or Organic, there was agreement that certain analytical concepts must be taught in the first year. Likewise although we were not in agreement whether a sophomore analytical course should be replaced by, say Inorganic or Physical, certain concepts complementing the first-year course must be included. The sequence for Organic and Physical does not seem to be important. All agreed that advanced analytical (including instrumental analysis) should come after Physical. The group also agreed that qualitative analysis as a separate course is finished.

Some areas, such as stoichiometry, ionic equilibrium, free energy, Redox and EMF's should be introduced in the first year. In doing this, someone suggested that we should "give the students the truth but not necessarily the whole truth." We will need to build on, and add to, these concepts in later courses.

Certain topics could be handled equally well in Analytical or Physical, whichever comes first, such as: physical character of precipitate, colorimetry, errors and handling of data, and potentiometric titrations and pH measurement. Physical properties of compounds (refractive index, viscosity, etc.) and some acid-base titrations could be included in the organic laboratory.

The topics remaining for an advanced analytical course are: analytical separations, chromatography and ion exchange (might have been introduced in organic), applications of radiochemistry, spectrophotometric analysis, and various electrical methods (coulometry, etc.).

BIBLIOGRAPHY

- (1) Educational Trends in Analytical Chemistry, A Symposium.
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- (2) Bucknell University Conference on Undergraduate Chemical
Education, Sub-group Reports
- (3) Changes in College Chemistry Teaching, Campbell. C&EN,
p 88, August 22, 1960
- (4) "Letters to the Editor", C&EN, p 5, September 26 and
October 31, 1960.

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