Comments and Communications

Preparation of the Phosphatase Reagent Disodium *p*-Nitrophenyl Phosphate

Bessey and Love (*1*) have recently described a method for the preparation of the disodium salt of *p*-nitrophenyl phosphate which has the advantage of giving a better yield of the salt than the method of Ohmori (*2*). To obtain an essentially pure product, Bessey and Love recommend recrystallization from boiling 87% alcohol and drying over P_2O_5, stating that the preparation becomes yellower with time.

During the development and use of a sensitive method of testing the efficiency of milk pasteurization (*3*), we have gained much experience of this substrate which, for the differentiation of the small amounts of residual phosphatase left in heat-treated milk, must be of a high degree of purity and substantially free of yellow color.

It has been found difficult to obtain colorless crystals of the *p*-nitrophenyl phosphate by methods involving the use of *hot* solvents, such as the recrystallization from boiling 87% alcohol or the precipitation with acetone from solutions in hot aqueous methanol as recommended by Axelrod (*4*). Pure white crystals are more easily obtained by the following modification of Axelrod's purification procedure. The crude disodium salt is dissolved in *cold* 90% methanol at the rate of about 20 ml/g, and an equal volume of acetone is added to the filtered solution. The crystals are filtered off and washed with a volume of acetone equal to that originally added. A second crop of crystals is obtained from the mixture of filtrate and washings. The crystals are spread on filter paper and air-dried.

Disodium *p*-nitrophenyl phosphate crystallizes with 2 molecules of H_2O. It loses this water quite easily, and any loss causes yellowing of the crystals. Actual desiccation should, therefore, be avoided and air-drying of the ether or acetone washed crystals should be considered the method of choice. During and after drying the crystals should be protected from strong light, as this is also detrimental.

In well-stoppered containers, colorless air-dried preparations have been kept in an ice box for several years without visible discoloration. Even at room temperature, little deterioration has been observed after storage for several months, provided that care has been taken to prevent any access of light.

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References

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2. Ohmori, Y. *Enzymologia*, **4**, 217 (1937).
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4. Axelrod, B. *J. Biol. Chem.*, **167**, 57 (1947).

Documentation

The paper by Raimon L. Beard *et al.* on documentation (Science, **116**, 553 [1952]) was read with particular interest. The collecting, classifying, coding and indexing of scientific and technical literature has become so large an undertaking nowadays that it is frightening to think what it will be like in even 10 or 20 years. The only answer lies in some mechanical means of recording this enormous wealth of knowledge. But in the first place this information must be put on to a card, tape, disc, or film and that means a human indexer, since no machine can yet read and understand a scientific paper in a journal.

Dr. Beard's remarks about abstracting journals that ". . . indexing is based on the titles or abstracts, not on the original contribution . . ." is not true of all these journals. Nor is the indexing of the original paper beyond the scope of the abstracting services as he claims it is. Through lack of funds, inadequate support or staffing problems, it is necessary in some organizations to index from an abstract; probably no editor or abstractor will agree that such index entries are as good as those prepared from the original paper.

The ideal index entries must surely be prepared by the individual with a specialist knowledge of the subject matter of the paper, who has read it, written the abstract and is therefore in the best position to know the units and sub-units of thought in the original. This demands a new approach to documentation in that it is the specialist (not an indexer) who does the work of abstracting and indexing, and can thus bring his expert knowledge to bear on both the subject matter for the abstract and the right subject index entries.

This system is not just a hypothetical ideal: it has been in practice very successfully in several centres, and in particular with *Dairy Science Abstracts*. The human indexer who is primarily a specialist is best able to put the proper entries into an index, be it card, tape, disc or film.

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Regarding our paper on documentation (Science, **116**, 553 [1952]), such generalities as referred to by Dr. Marsden inevitably lead to exceptions. The abstracting and indexing services merit the highest praise, and the exceptional ones deserve special recognition and encouragement in their efforts to perform an increasingly difficult function.

With the assurance of Dr. Marsden that indexes to abstracts can be prepared in such a way that the important casual observation, incidental to the main theme of a paper, gets recognition, the facilities being tested by the Chemical-Biological Coordination Center offer no advantages over the more conventional ap-