

Specification for

Cyanmethaemoglobin (haemiglobincyanide) solution for photometric haemoglobinometry

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- Association of Clinical Pathologists
- British Committee for Standards in Haematology
- British Society for Haematology
- Institute of Medical Laboratory Sciences
- Medical Research Council
- Medical Sterile Products Association
- Ministry of Agriculture Fisheries and Food
- Public Health Laboratory Service
- Royal College of Pathologists

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Foreword

This British Standard was first published in 1966 and the present revision brings up to date various references and forms of expression.

Photoelectric spectrophotometers and filter photometers (visual or photoelectric) are now widely used for the determination of haemoglobin. When compared with older methods, they are fast and precise, but they require calibration if the results are to be obtained in absolute terms. The most generally applicable method of calibration utilizes a solution of similar composition to the samples being measured. The spectral transmittance of such a standard solution is closely similar to that of the test solutions, and all solutions can be placed in the light path of the instrument in precisely the same place. It follows that this procedure minimizes many of the errors arising from failure to use monochromatic light or geometrically sound optical systems.

In the last decade, there have been developments in the use of cyanmethaemoglobin as the preferred pigment for measurement. Improved reagents have been specified which will rapidly and completely convert the haemoglobin of blood samples into the desired pigment, producing test solutions which are conspicuously less subject to turbidity originating from the serum proteins. Also, a method has been devised for preparing a reference solution stable enough to be useful for at least 6 years (van Assendelft *et al.* 1976).

The International Committee for Standardization in Haematology (ICSH) established specifications for a cyanmethaemoglobin standard, taking the millimolar absorption coefficient of haemoglobinocyanide to be 11.0 at a wavelength of 540 nm (the absorbance of a solution containing 55.85 mg/l of haemoglobin iron and having a light path length of 1.000 cm) and the relative molecular mass of haemoglobin as $\frac{64\,458}{4}$, (Braunitzer, 1964). These specifications also comply with the International Committee for Standardization in Haematology standard which was established at the tenth Congress of the International Society of Haematology (ICSH, 1978) and which was subsequently adopted by the World Health Organization as an international reference preparation. To comply with these specifications, the solution has to lie within the relatively narrow concentration range of 550 mg/l to 850 mg/l of cyanmethaemoglobin.

During the preparation of this British Standard, several comments were raised suggesting that solutions of other concentrations should also be specified so that the British Standard would have a wider application and such matters as linearity of response could also be tested. Similar considerations have been raised with the International Committee for Standardization in Haematology. However, the measurement of cyanmethaemoglobin solutions differing widely from the specified concentration introduces a number of technical difficulties which are undesirable in connection with a primary reference preparation. This does not of course exclude the preparation and use of solutions of other concentrations if they are required for particular haemoglobinometers, but these solutions do not comply with the requirements of this British Standard.

References

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