NATIONAL STANDARD METHOD

UREASE TEST

BSOP TP 36

Issued by Standards Unit, Evaluations and Standards Laboratory
Specialist and Reference Microbiology Division
STATUS OF NATIONAL STANDARD METHODS

National Standard Methods, which include standard operating procedures (SOPs), algorithms and guidance notes, promote high quality practices and help to assure the comparability of diagnostic information obtained in different laboratories. This in turn facilitates standardisation of surveillance underpinned by research, development and audit and promotes public health and patient confidence in their healthcare services. The methods are well referenced and represent a good minimum standard for clinical and public health microbiology. However, in using National Standard Methods, laboratories should take account of local requirements and may need to undertake additional investigations. The methods also provide a reference point for method development.

National Standard Methods are developed, reviewed and updated through an open and wide consultation process where the views of all participants are considered and the resulting documents reflect the majority agreement of contributors.

Representatives of several professional organisations, including those whose logos appear on the front cover, are members of the working groups which develop National Standard Methods. Inclusion of an organisation’s logo on the front cover implies support for the objectives and process of preparing standard methods. The representatives participate in the development of the National Standard Methods but their views are not necessarily those of the entire organisation of which they are a member. The current list of participating organisations can be obtained by emailing standards@hpa.org.uk.

The performance of standard methods depends on the quality of reagents, equipment, commercial and in-house test procedures. Laboratories should ensure that these have been validated and shown to be fit for purpose. Internal and external quality assurance procedures should also be in place.

Whereas every care has been taken in the preparation of this publication, the Health Protection Agency or any supporting organisation cannot be responsible for the accuracy of any statement or representation made or the consequences arising from the use of or alteration to any information contained in it. These procedures are intended solely as a general resource for practising professionals in the field, operating in the UK, and specialist advice should be obtained where necessary. If you make any changes to this publication, it must be made clear where changes have been made to the original document. The Health Protection Agency (HPA) should at all times be acknowledged.

The HPA is an independent organisation dedicated to protecting people’s health. It brings together the expertise formerly in a number of official organisations. More information about the HPA can be found at www.hpa.org.uk.

The HPA aims to be a fully Caldicott compliant organisation. It seeks to take every possible precaution to prevent unauthorised disclosure of patient details and to ensure that patient-related records are kept under secure conditions.

More details can be found on the website at www.evaluations-standards.org.uk. Contributions to the development of the documents can be made by contacting standards@hpa.org.uk.

Please note the references are now formatted using Reference Manager software. If you alter or delete text without Reference Manager installed on your computer, the references will not be updated automatically.

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Each National Standard Method has an individual record of amendments. The current amendments are listed on this page. The amendment history is available from standards@hpa.org.uk.

On issue of revised or new pages each controlled document should be updated by the copyholder in the laboratory.
INTRODUCTION

The test is used to differentiate urease-positive *Proteus* species from others members of the Enterobacteriaceae. Some strains of *Enterobacter* and *Klebsiella* species are also urease-positive. The test may be used to distinguish *Psychrobacter phenylpyruvicus* from *Moraxella* species. *Corynebacterium diptheriae* is urease-negative which differentiates it from the urease-positive *Corynebacterium ulcerans* and *Corynebacterium pseudotuberculosis*. *Helicobacter pylori* also possesses the ability to split urea. Most *Brucella* species are urease-positive. *Bacteroides ureolyticus* splits urea rapidly, usually within a few minutes, and is a quick way of identifying this organism. The urease test may aid in the identification of *Cryptococcus* species which produces a positive result after prolonged incubation.

TEST PRINCIPLE

The urease test is used to determine the ability of an organism to split urea by production of the enzyme urease. Two units of ammonia are formed with resulting alkalinity. The production of alkali is detected by a pH indicator.

Christensen’s urea contains the pH indicator phenol red which under acid conditions (pH 6.8) is yellow. In alkaline conditions (pH 8.4) the indicator turns the media rose pink.

1.0 SAFETY CONSIDERATIONS

Refer to current guidance on the safe handling of all organisms and reagents documented in this SOP.

All work likely to generate aerosols must be performed in a microbiological safety cabinet.

The above guidance should be supplemented with local COSHH and risk assessments.

Compliance with postal and transport regulations is essential.

2.0 REAGENTS AND EQUIPMENT

Discrete colonies growing on solid medium

Christensen’s medium (MSOP 55) or liquid alternative

Alternatively, a commercially available reagent may be used according to the manufacturer’s instructions

Bacteriological straight wire/loop (preferably nichrome) or disposable alternative

Quality Control Organisms

Positive control: *Providencia rettgeri* NCTC 7475

Negative control: *Serratia marcescens* NCTC 11935
3.0 METHOD/PROCEDURE AND RESULTS

Quality control should be carried out on each batch of media. For quality assurance see Media Specifications.

All identification tests should be performed, where possible, from a non-selective medium. If the test is performed from selective agar, a purity plate must be included to check for purity of the organism.

Inoculate slope heavily over the entire surface

Incubate inoculated slope at 35-37°C in a water bath or hot block or incubator

Examine slopes after 4h and after overnight incubation

**Positive result**  purple/pink colour

**Negative result**  colour of medium remains unchanged

4.0 PRECAUTIONS/LIMITATIONS OF PROCEDURE

N/A
REFERENCES


