ESDU 02001
Issued May 2002
With Amendment A
November 2006

Viscosity of liquids: Aliphatic nitriles

Endorsed by
The Institution of Chemical Engineers

ESDU DATA ITEMS

Data Items provide validated information in engineering design and analysis for use by, or under the supervision of, professionally qualified engineers. The data are founded on an evaluation of all the relevant information, both published and unpublished, and are invariably supported by original work of ESDU staff engineers or consultants. The whole process is subject to independent review for which crucial support is provided by industrial companies, government research laboratories, universities and others from around the world through the participation of some of their leading experts on ESDU Technical Committees. This process ensures that the results of much valuable work (theoretical, experimental and operational), which may not be widely available or in a readily usable form, can be communicated concisely and accurately to the engineering community.

We are constantly striving to develop new work and review data already issued. Any comments arising out of your use of our data, or any suggestions for new topics or information that might lead to improvements, will help us to provide a better service.

THE PREPARATION OF THIS DATA ITEM

The work on this particular Data Item was monitored and guided by the Physical Data and Reaction Kinetics Committee, which first met in 1966 and now has the following membership:

Chairman

Dr D.T. Jamieson	—	Independent

Vice-Chairman

Mr C.F. Beaton	—	Independent

Members

Dr D. Ambrose*	—	Independent
Dr J.H. Dymond	—	The University, Glasgow, UK
Dr B. Edmonds	—	Infochem Computer Services Ltd, London, UK
Dr M. Frenkel†	—	Thermodynamics Research Center, National Institute of Standards &Technology, Boulder, USA
Dr Sumnesh Gupta†	—	Dow Chemical, Midland, USA
Mr S. Hinley	—	Imperial Chemical Industries plc, S.T.G. Wilton, UK
Dr G. Hobson	—	Independent
Dr A.E. Humphreys	—	Independent
Dr A.I. Johns	—	National Engineering Laboratory, East Kilbride, UK
Mr S.R. Knight	—	Stone & Webster Engineering Ltd, Milton Keynes, UK
Dr A.P. Laughton	—	Advantica Technologies Ltd, Loughborough, UK
Dr K.N. Marsh†	—	University of Canterbury, New Zealand
Mrs K.M. de Reuck	—	Imperial College of Science, Technology & Medicine, London, UK
Dr C. Tsonopoulos†	—	Independent
Mr J.T.R. Watson	—	Independent.

* Emeritus Member.
† Corresponding Member.

The technical work involved in the assessment of the available information and the construction and subsequent development of the Data Item was undertaken (under contract to ESDU) by

Dr J.H. Dymond	—	The University, Glasgow.

The person with overall responsibility for the work in this subject area is Mr S.J. Pugh, Head of Thermofluids Group.

ESDU 02001

VISCOSITY OF LIQUIDS: ALIPHATIC NITRILES

CONTENTS

Data Sheets for each of the liquids are given in the following order:-

VISCOSITY OF LIQUIDS: ALIPHATIC NITRILES

1. INTRODUCTION

This Item presents values for the viscosity at saturation pressure, in tabular form, for liquid aliphatic nitriles. In general the range covered is from just above the melting temperature to about 0.9 times the critical temperature.

The values given are based on data which are believed to be the most reliable available and have been reviewed and suitably extended. In common with other Items, quantities are expressed in SI units and conversion factors to other units are provided in Section 3.

Section 4 gives the procedure used to obtain the values of viscosity presented and indicates the effect of pressure. Section 5 gives an explanation of the Tables and indicates the uncertainties in the values presented.

Appendix A provides a complete bibliography of data sources for this Item. Data sources for individual compounds are listed on the appropriate Data Sheet.

2. NOTATION AND UNITS

The SI unit of dynamic viscosity is the newton second per square metre (N s/m^2). The values presented in the tables are given in millinewton second per square metre (mN s/m^2), a submultiple which is convenient for the magnitudes considered and which is equal to the c.g.s. centipoise (cP).

A, B	dimensionless constants for each liquid in Equation (4.1)	–
C	constant for each liquid in Equation (4.2)	K
D	constant for each liquid in Equation (4.1)	mN s/m^2
p	pressure	N/m^2 (Pa)
T	kelvin temperature	K
t	Celsius temperature, $T - 273.15$	°C
α	constant in Equation (4.3)	m^2/N
η	dynamic viscosity	mN s/m^2 (cP)
θ	dimensionless temperature dependent variable in Equation (4.2)	–

Subscripts

c	denotes value at the critical point
p	denotes value at pressure p
r	denotes reduced quantity, *e.g.* $T_r = T/T_c$.

Issued May 2002 - 30 pages
With Amendment A - November 2006