COMPONENTS:	EVALUATOR:
(1) 1-Heptene; C_7H_{14}; [592-76-7] (2) Water; H_2O; [7732-18-5]	G.T. Hefter, School of Mathematical and Physical Sciences, Murdoch University, Perth, W.A., Australia. July 1985

CRITICAL EVALUATION:

Quantitative data for the solubility of water (2) in 1-heptene (1) have been reported in the publications listed in Table 1.

TABLE 1: Quantative Solubility Studies of Water (2) in 1-Heptene (1)

Reference	T/K	Method
Black *et al.* (ref 1)	283-294	radiotracer
Englin *et al.* (ref 2)	283-303	analytical

The solubility of 1-heptene in dilute aqueous HNO_3 solutions have also been reported (ref 3). However, as no other data are available for comparison these values will not be considered in this Evaluation. The interested user is referred to the relevant Data Sheet immediately following this Critical Evaluation.

The reported values (ref 1 and 2) for the solubility of water in 1-heptene are listed in Table 2.

The data are in very poor agreement. In the absence of confirmatory studies selection of best values is difficult. However, it may be noted that in well characterized systems (e.g., water in benzene) the results of Englin *et al.* at T <300K are generally reliable whilst those of Black *et al.* generally differ markedly from Recommended values. Thus, values of Englin *et al.* (ref 2) have been selected as the "Best" values available although, in the absence of confirmatory studies, it is not possible at this stage to reject outright the data of Black *et al.* (ref 1).

(continued next page)

COMPONENTS:	EVALUATOR:
(1) 1-Heptene; C_7H_{14}; [592-76-7]	G.T. Hefter, School of Mathematical and Physical Sciences, Murdoch University, Perth, W.A., Australia
(2) Water; H_2O; [7732-18-5]	July 1985

CRITICAL EVALUATION: (continued)

TABLE 2: Tentative Values of the Solubility of Water (2) in 1-Heptene (1)

T/K	Solubility Values		
	Reported values $10^2 g(2)/100g$ sln	"Best" values[a] $10^2 g(2)/100g$ sln	$10^3 x_2$
283	6.92 (ref 1), 1.86 (ref 2)	1.9	1.0
293	11.2 (ref 1), 2.49 (ref 2)	2.5	1.4
298	3.2[b] (ref 2)	3.2	1.7
303	3.75 (ref 2)	3.8	2.0

[a] Rounded values of Englin *et al.* (ref 2); see text.

[b] Obtained by the Evaluator by graphical interpolation.

REFERENCES

1. Black, C.; Joris, G.G.; Taylor, H.S. *J. Chem. Phys.* 1948, *16*, 537-43.
2. Englin, B.A.; Plate, A.F.; Tugolukov, V.M.; Pryanishnikova, M.A. *Khim. Tekhnol. Topl. Masel* 1965, *10*, 42-6.
3. Natarajan, G.S.; Venkatachalam, K.A. *J. Chem. Eng. Data.* 1972, *17*, 328-9.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) 1-Heptene; C_7H_{14}; [592-76-7]	Black, C.; Joris, G.G.; Taylor, H.S.
(2) Water; H_2O; [7732-18-5]	*J. Chem. Phys.* 1948, *16*, 537-43.
VARIABLES:	PREPARED BY:
Temperature: 10 - 21.2°C	A. Maczynski and Z. Maczynska

EXPERIMENTAL VALUES:

Solubility of water in 1-heptene

t/°C	g(2)/100 g(1)	g(2)/100 g sln (compiler)	$10^3 x_2$ (compiler)
10.0	0.0692	0.0692	3.76
20.1	0.1126	0.1126	6.11
20.5	0.1047	0.1047	5.68
21.2	0.1158	0.1158	6.28

(at total saturation pressure of 1 atm)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Air saturated with radioactive water vapor was bubbled through (1) until saturation was attained. Dissolved water was separated from (1) by absorption on calcium oxide. The tritium was transferred into the counter by equilibration with ethanol vapor. The method is described in ref (1).

SOURCE AND PURITY OF MATERIALS:

(1) Havard University; purity not specified; used as received.

(2) not specified.

ESTIMATED ERROR:

soly. ± 1% (type or error not specified)

REFERENCES:

1. Joris, G.G.; Taylor, H.S.
J. Chem. Phys. 1948, *16*, 45.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) 1-Heptene; C_7H_{14}; [592-76-7] (2) Water; H_2O; [7732-18-5]	Englin, B.A.; Plate, A.F.; Tugolukov, V.M.; Pryanishnikova, M.A. *Khim. Tekhnol. Topl. Masel* 1965, *10*, 42-6.
VARIABLES: Temperature: 10-30°C	PREPARED BY: A. Maczynski and Z. Maczynska

EXPERIMENTAL VALUES:

Solubility of water in 1-heptene

t/°C	g(2)/100 g sln	$10^3 x_2$ (compiler)
10	0.0186	1.01
20	0.0249	1.36
30	0.0375	2.04

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Component (1) was introduced into a thermostatted flask and saturated for 5 hr. with (2). Next, calcium hydride was added and the evolving hydrogen volume measured and hence the concentration of (2) in (1) was evaluated.

SOURCE AND PURITY OF MATERIALS:

(1) not specified.

(2) not specified.

ESTIMATED ERROR:

Not specified.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) 1-Heptene; C_7H_{14}; [592-76-7] (2) Water; H_2O; [7732-18-5]	Natarajan, G.S.; Venkatachalam, K.A. *J. Chem. Eng. Data* 1972, *17*, 328-9
VARIABLES: Temperature: 20-30°C	PREPARED BY: M.C. Haulait-Pirson, G.T. Hefter

EXPERIMENTAL VALUES:

Solubility of 1-heptene in 0.001 mol L^{-1} HNO_3 solution

t/°C	10^4 mol L^{-1} sln[a]	10^3 g(1)/100 g sln[b] (compiler)	10^6 x_1 (compiler)
20	3.16 ± 0.13	3.1	5.7
25	2.81 ± 0.12	2.8	5.1
30	2.45 ± 0.15	2.4	4.4

a Uncertainties stated to be "standard deviations from means".

b Assuming a solution density of 1.00 g mL^{-1} at all temperatures.

Compiler's note: Although the data have not been measured in pure water the low concentration of the added acid is unlikely to cause the olefin solubility to differ markedly from that in pure water. Further solubility data are given in the paper for 0.05 and 0.1 mol L^{-1} HCℓ .

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
15 mL of the aqueous medium was equilibrated with 1 mL of (1) by mechanical shaking in a thermostatted glass burette. After settling (judged visually), 5 mL of the aqueous layer was withdrawn and the olefin content determined by titration with bromine using standard procedures.	(1) Matheson, Coleman and Bell; 99%. (2) Not specified.
	ESTIMATED ERROR: Temp. ± 0.05 K Soly. see table above.
	REFERENCES: