COMPONENTS:	EVALUATOR:
(1) sec-Butylbenzene; $C_{10}H_{14}$; [135-98-8] (2) Water; H_2O; [7732-18-5]	A. Maczynski Institute of Physical Chemistry of the Polish Academy of Sciences Warszawa, Poland. November 1981

CRITICAL EVALUATION:

The solubility of sec-butylbenzene (1) in water (2) has been reported in three works listed below:

Authors	Method	T/K	g(1)/100 g sln
Andrews and Keefer (ref 1)	spectrophotometric	298.15	0.0309
Sutton and Calder (ref 3)	GLC	298.15	0.00176
Krzyzanowska and Szeliga (ref 4)	GLC	298.15	0.00101

The data of Andrews and Keefer seem to be high. The mean value of the remaining data is tentative.

The solubility of water (2) in sec-butylbenzene (1) has been reported in one work listed below:

Authors	Method	T/K
Englin *et al.* (ref 2)	gasometric	273.15-323.15

Since these data are from one source only, they are regarded as tentative.

SOLUBILITY OF sec-BUTYLBENZENE (1) IN WATER (2)
TENTATIVE VALUE

T/K	g(1)/100 g sln	x_1
298	0.0014	1.9×10^{-6}

SOLUBILITY OF WATER (2) IN sec-BUTYLBENZENE (1)
TENTATIVE VALUES

T/K	g(2)/100 g sln	x_2
283	0.020	0.0020
293	0.029	0.0029
303	0.039	0.0038

REFERENCES

1. Andrews, L.J.; Keefer, R.M. *J. Amer. Chem. Soc.* 1950, *72*, 5034-7.
2. Englin, B.A.; Plate, A.F.; Tugolukov, V.M.; Pryanishnikova, M.A. *Khim. Tekhnol. Topl. Masel* 1965, *10*, 42-6.
3. Sutton, C.; Calder, J.A. *J. Chem. Eng. Data* 1975, *20*, 320-2.
4. Krzyzanowska, T.; Szeliga, J. *Nafta (Katowice)* 1978, *12*, 413-7.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) sec-Butylbenzene; $C_{10}H_{14}$; [135-98-8] (2) Water; H_2O; [7732-18-5]	Andrews, L.J.; Keefer, R.M. *J. Am. Chem. Soc.* 1950, *72*, 5034-7.
VARIABLES:	**PREPARED BY:**
One temperature: 25°C	A. Maczynski and Z. Maczynska

EXPERIMENTAL VALUES:

The solubility of sec-butylbenzene in water at 25°C was reported to be 0.0309 g(1)/100 g sln.

The corresponding mole fraction, x_1 calculated by the compilers is 4.15×10^{-6}.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

A mixture of (1) and (2) was rotated for twenty hours in a constant temperature bath at 25°C. A sample (5-20 mL) of the aqueous phase was withdrawn and extracted with a measured volume of hexane (10-50 mL) by shaking in a glass-stoppered Erlenmeyer flask. Next, the absorbance of the hexane phase was measured against a hexane blank on the Beckman spectrophotometer.

SOURCE AND PURITY OF MATERIALS:

(1) Eastman Kodak Co. white label; fractionally distilled; b.p. range 175.0-175.8°C.

(2) not specified.

ESTIMATED ERROR:

not specified.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) sec-Butylbenzene; $C_{10}H_{14}$; [135-98-8] (2) Water; H_2O; [7732-18-5]	Englin, B.A.; Plate, A.F.; Tugolukov, V.M.; Pryanishnikova, M.A. *Khim. Tekhnol. Topl. i Masel* 1965, *10*, 42-6.
VARIABLES:	PREPARED BY:
Temperature: 10-30°C	A. Maczynski and Z. Maczynska

EXPERIMENTAL VALUES:

Solubility of water in sec-butylbenzene

t/°C	g(2)/100 g sln	x_2 (compiler)
10	0.0226	0.00223
20	0.0317	0.00313
30	0.0426	0.00420

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
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.	(1) not specified. (2) not specified.
	ESTIMATED ERROR: Not specified.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) sec-Butylbenzene; $C_{10}H_{14}$; [135-98-8] (2) Water; H_2O; [7732-18-5]	Sutton, C.; Calder, J.A. *J. Chem. Eng. Data* 1975, *20*, 320-2.
VARIABLES: One temperature: 25°C	**PREPARED BY:** A. Maczynski and Z. Maczynska

EXPERIMENTAL VALUES:

The solubility of sec-butylbenzene in water at 25°C was reported to be 17.6 mg(1)/kg(2). The corresponding mass percent and mole fraction, x_1, calculated by the compilers are 0.00176 g(1)/100 g sln and 2.36×10^{-6}.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The concentration of (1) in (2) was determined by gas chromatography.	(1) Aldrich Chemical Co. or Matheson Coleman and Bell 99+%. (2) distilled.
	ESTIMATED ERROR: temp. ± 0.1°C soly. 0.2 (the standard deviation of the mean for six replicates).
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) sec-Butylbenzene; $C_{10}H_{14}$; [135-98-8] (2) Water; H_2O; [7732-18-5]	Krzyzanowska, T.; Szeliga, J. *Nafta (Katowice)*, 1978, *12*, 413-7.
VARIABLES:	**PREPARED BY:**
One temperature: 25°C	M.C. Haulait-Pirson

EXPERIMENTAL VALUES:

The solubility of sec-butylbenzene in water at 25°C was reported to be 10.1 mg(1)/kg(2).

The corresponding mass percent and mole fraction, x_1, calculated by compiler are 0.00101 g(1)/100 g sln and 1.36×10^{-6}.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The saturated solutions of (1) in (2) were prepared in two ways. First, 200 µL of (1) was injected into 20 mL of (2) and thermostatted at 25°C. Second, the mixture of (1) and (2) as above was thermostatted at 70°C and then cooled to 25°C. The time required to obtain equilibrium was three weeks. The solubility of (1) in (2) was measured by glc. A Perkin-Elmer model F-11 gas chromatograph equipped with a 100-150 mesh Porasil column (70°C) and a flame ionization detector was used. Saturated solutions of heptane in (2) were used as standard solutions.

SOURCE AND PURITY OF MATERIALS:

(1) not specified.

(2) not specified.

ESTIMATED ERROR:

soly. 0.3 mg(1)/kg(2) (standard deviation from 7-9 determinations).

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) sec-Butylbenzene; $C_{10}H_{14}$; [135-98-8] (2) Artificial seawater (ref 1)	Sutton, C.; Calder, J.A. *J. Chem. Eng. Data* 1975, *20*, 320-2.
VARIABLES: One temperature: 25.0°C One salinity: 34.5 g salts/kg sln	**PREPARED BY:** M. Kleinschmidt and W. Shiu

EXPERIMENTAL VALUES:

The solubility of sec-butylbenzene in artificial seawater is reported to be 11.9 mg(1)/kg sln. The corresponding mass percent and mole fraction, x_1 calculated by the compiler are 1.19×10^{-3} g(1)/100 g sln and 1.64×10^{-6} assuming the artificial seawater composition of ref 1.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A test tube containing (1) was placed in a flask containing (2) thus allowing for equilibration through the vapor phase. The saturated solution was extracted with hexane and analyzed by gas chromatography.	(1) from either Aldrich Chemical Co. or Matheson Coleman and Bell, 99+% pure. (2) made from doubly distilled water and salts 99+% pure.
	ESTIMATED ERROR: temp. ± 0.1°C soly. 0.2 (std. dev.)
	REFERENCES: 1. Lyman, J.; Fleming, R.H.; *J. Mar. Res.* 1940, *3*, 135.