

COMPONENTS: (1) Naphthacene; C <sub>18</sub> H <sub>12</sub> ; [92-24-0] (2) Water; H <sub>2</sub> O; [7732-18-5]	EVALUATOR: G.T. Hefter, School of Mathematical and Physical Sciences, Murdoch University, Perth, W.A., Australia. A. Maczynski, Institute of Physical Sciences, Warszawa, Poland. June 1986.
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## CRITICAL EVALUATION:

Quantitative solubility data for naphthacene (1) in water (2) have been reported in the publications listed in Table 1. No data have been reported on the solubility of water in naphthacene.

TABLE 1. Quantitative Solubility Studies of Naphthacene (1) in Water (2)

Reference	T/K	Method
Davis <i>et al.</i> (ref 1)	300	nephelometric
Klevens (ref 2)	298	spectrophotometric
Mackay and Shiu (ref 3)	298	spectrofluorometric

The original data in all of these publications are compiled in the Data Sheets immediately following this Critical Evaluation.

The data are also summarized in Table 2 below. The reported values are in poor agreement. The value of Mackay and Shiu (ref 3) being lower than the other reported values (ref 1,2) is preferred as the Tentative solubility at 298K.

TABLE 2. Tentative Solubility Value of Naphthacene (1) in Water (2)

T/K	Solubility values		
	Reported values 10 <sup>8</sup> g(1)/100 g sln	"Best" value 10 <sup>8</sup> g(1)/100 g sln	10 <sup>11</sup> x <sub>1</sub>
298	15 <sup>a</sup> (ref 2), 5.7 (ref 3)	6	5
300	10 <sup>a</sup> (ref 1)		

<sup>a</sup> Values probably high.

## REFERENCES

1. Davis, W.W.; Krahl, M.E.; Cloves, G.H.A. *J. Am. Chem. Soc.* 1942, *64*, 108-10.
2. Klevens, H.B. *J. Phys. Chem.* 1950, *54*, 283-98.
3. Mackay, D.; Shiu, W.Y. *J. Chem. Eng. Data* 1977, *22*, 399-402.

<b>COMPONENTS:</b>  (1) Naphthacene; C <sub>18</sub> H <sub>12</sub> ; [92-24-0] (2) Water; H <sub>2</sub> O; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b>  Davis, W.W.; Krahl, M.E.; Cloves, G.H.A.  <i>J. Am. Chem. Soc.</i> <u>1942</u> , <i>64</i> , 108-10.						
<b>VARIABLES:</b>  One temperature: 27°C	<b>PREPARED BY:</b>  M.C. Haulait-Pirson						
<b>EXPERIMENTAL VALUES:</b>  <p style="text-align: center;">Solubility of naphthacene in water</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;"><u>t/°C</u></th> <th style="text-align: center;"><u>10<sup>6</sup> g(1) L<sup>-1</sup> (2)</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">27</td> <td style="text-align: center;">1.0 ± 0.5</td> </tr> <tr> <td></td> <td style="text-align: center;">1.0 ± 0.2</td> </tr> </tbody> </table> <p>The best value recommended by the authors is 1.0 x 10<sup>-6</sup> g(1) L<sup>-1</sup> (2).            Assuming that 1.00 L sln = 1.0 kg sln, the corresponding mass percent            and mole fraction, <math>x_1</math>, calculated by the compiler are 1.0 x 10<sup>-7</sup> g(1)/            100 g sln and 7.9 x 10<sup>-11</sup>.</p>		<u>t/°C</u>	<u>10<sup>6</sup> g(1) L<sup>-1</sup> (2)</u>	27	1.0 ± 0.5		1.0 ± 0.2
<u>t/°C</u>	<u>10<sup>6</sup> g(1) L<sup>-1</sup> (2)</u>						
27	1.0 ± 0.5						
	1.0 ± 0.2						
<b>AUXILIARY INFORMATION</b>							
<b>METHOD/APPARATUS/PROCEDURE:</b>  The method consisted of preparing serial dilutions of a suspension of (1) in (2) and determining nephelometrically the amount of (1) per unit volume beyond which further dilution caused no reduction in light scattering, which remained equal to that of pure (2). A Bausch and Lomb Dubosque colorimeter model 100-mm was employed. Many details are reported in ref 1.	<b>SOURCE AND PURITY OF MATERIALS:</b>  (1) prepared at Harvard University; m.p. range 341.5-343.0°C; (cf. ref 2).  (2) dust-free.						
	<b>ESTIMATED ERROR:</b> temp. ± 3°C soly. see above						
	<b>REFERENCES:</b> 1. Davis, W.W.; Parker, Jr., T.V. <i>J. Am. Chem. Soc.</i> <u>1942</u> , <i>64</i> , 101. 2. Davis, W.W.; Krahl, M.E.; Cloves, G.H.A. <i>J. Am. Chem. Soc.</i> <u>1940</u> , <i>62</i> , 3086.						

<b>COMPONENTS:</b>  (1) Naphthacene; $C_{18}H_{12}$ ; [92-24-0] (2) Water; $H_2O$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b>  Klevens, H.B. <i>J. Phys. Chem.</i> <u>1950</u> , <i>54</i> , 283-98.
<b>VARIABLES:</b>  Temperature: 25°C	<b>PREPARED BY:</b>  M.C. Haulait-Pirson
<b>EXPERIMENTAL VALUES:</b>  The solubility of naphthacene in water at 25°C was reported to be $6.6 \times 10^{-9}$ mol(l) $L^{-1}$ sln. Assuming that 1.00 L sln = 1.00 kg sln, the corresponding mass percent and mole fraction calculated by the compiler are $1.5 \times 10^{-7}$ g(1)/100 g sln and $1.2 \times 10^{-10}$ .	
<b>AUXILIARY INFORMATION</b>	
<b>METHOD/APPARATUS/PROCEDURE:</b>  The solubility of (1) in (2) was determined by shaking small amounts of (1) in 1 liter of (2) for as long as three months. Aliquots were removed and concentrations determined by spectra.	<b>SOURCE AND PURITY OF MATERIALS:</b>  (1) not specified. (2) not specified.  <b>ESTIMATED ERROR:</b>  not specified.  <b>REFERENCES:</b>

<b>COMPONENTS:</b> (1) Naphthacene; C <sub>18</sub> H <sub>12</sub> ; [92-24-0] (2) Water; H <sub>2</sub> O; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Mackay, D.; Shiu, W.Y. <i>J. Chem. Eng. Data</i> <u>1977</u> , 22, 399-402.
<b>VARIABLES:</b> One temperature: 25°C	<b>PREPARED BY:</b> M.C. Haulait-Pirson
<b>EXPERIMENTAL VALUES:</b> <p>The solubility of naphthacene in water at 25°C was reported to be 0.00057 mg(1) dm<sup>-3</sup> sln and <math>\alpha_1 = 3.7 \times 10^{-11}</math>.</p> <p>The corresponding mass percent calculated by the compiler is <math>5.7 \times 10^{-8}</math> g(1)/100 g sln.</p>	
<b>AUXILIARY INFORMATION</b>	
<b>METHOD/APPARATUS/PROCEDURE:</b> A saturated solution of (1) in (2) was vigorously stirred in a 250 mL flask for 24 hrs. and subsequently settled at 25°C for at least 48 hrs. Then the saturated solution was decanted and filtered and 50-100 mL extracted with approximately 5 mL of cyclohexane in a separatory funnel. After shaking for 2 hrs. the cyclohexane extract was removed for analysis. An Aminco-Browman spectrophotofluorometer (American Instruments Ltd.) was used for analysis. Many details are given in the paper.	<b>SOURCE AND PURITY OF MATERIALS:</b> (1) Aldrich Chemicals, Eastman Kodak, or K and K Laboratories, commercial highest grade; used as received. (2) doubly distilled.  <b>ESTIMATED ERROR:</b> soly. $\pm 0.00003$ mg(1) dm <sup>-3</sup> sln (maximum deviation from several determinations).  <b>REFERENCES:</b>