Diffusion coefficient of toluene in methanol

3 Diffusion in Liquid Mixtures

3.1. Data

3.1.1. Diffusion in Binary Mixtures

$C_7 H_8$	(1)	toluene	108-88-3
$C H_4 O$	(2)	methanol	67-56-1
Mutual Diffusion Coefficient: $D_{12}(x_i)$; $T = 301 \pm 0.5$ K; Method: DIA			Ref.: [1991R2]
x_1	p [kPa]	$D \cdot 10^9$ [m^2/s]	
0.0000	101.32	1.374	
0.0955	101.32	1.264	
0.2036	101.32	1.185	
0.3744	101.32	1.170	
0.6180	101.32	1.364	
Intradiffusion Coefficient: D_{1T} (T); Method: TAYLOR			Ref.: [1987S14]
T [K]	ρ_2 [kg/m^3]	$D \cdot 10^9$ [m^2/s]	
313.2	774	3.05 ± 2%	
373.2	712	6.72 ± 2%	
423.2	651	11.1 ± 2%	
473.4	559	18.3 ± 2%	
Comment: tracer diffusivities along vapor–liquid coexistence curve, given liquid densities of methanol			
Intradiffusion Coefficient: D_{2T} (T); Method: DIA			Ref.: [1984E7]
T [K]	p [kPa]	$D \cdot 10^9$ [m^2/s]	
298.15	101.32	3.99 ± 1%	
Comment: values at trace concentration of ^{14}C labelled component (2)			

Symbols and Abbreviations

Short Form	Full Form
D	diffusion coefficient
p	pressure
T	temperature
TAYLOR	Taylor dispersion technique
DIA	diaphragm cell
x_i	mole fraction

References

[1984E7] Easteal, A. J., Woolf, L. A.: J. Chem. Soc., Faraday Trans. I **80** (1984) 1287–1295.
[1987S14] Sun, C. K. J., Chen, S. H.: Ind. Eng. Chem. Res. **26** (1987) 815–819.
[1991R2] Ramprasad, G., Das, T. R., Mukherjee, A. K.: J. Chem. Eng. Jpn. **24** (1991) 389–391.

https://doi.org/10.1007/978-3-662-54089-3_660