Activity Coefficients by the Two-Parameter Margules Equation

Activity coefficients of both components of a binary liquid mixture and the excess Gibbs energy from the two-parameter Margules equation with your constants.

Method: Two-parameter Margules G^E/RT = $x_1x_2(A_{21}x_1 + A_{12}x_2)$ (Smith, Van Ness and Abbott)

Input parameters

Unit system: SI

Parameter	Value	Unit
Margules constant A_{12} (= ln γ_1 at infinite dilution)	1.5000	
Margules constant A_{21} (= ln γ_2 at infinite dilution)	0.90000	
Mole fraction of component 1	30.000	%

Calculated results

Parameter	Value	Unit
Activity coefficient of 1	1.7482	
Activity coefficient of 2	1.1695	
Excess Gibbs energy over RT	0.27720	

Formula and method

$$\ln\gamma_1 = x_2^2\left[A_{12} + 2(A_{21} - A_{12})x_1\right], \quad \ln\gamma_2 = x_1^2\left[A_{21} + 2(A_{12} - A_{21})x_2\right]$$

Variables

A_{12}	Margules constant A_{12} (= ln γ_1 at infinite dilution)	-
A_{21}	Margules constant A_{21} (= ln γ_2 at infinite dilution)	-
x_1	Mole fraction of component 1	-
γ_1	Activity coefficient of 1	-
γ_2	Activity coefficient of 2	-
G^E/RT	Excess Gibbs energy over RT	-

Method and standards

Margules.

Assumptions and limits

- Binary liquid.

References

- Two-parameter Margules G^E/RT = $x_1x_2(A_{21}x_1 + A_{12}x_2)$ (Smith, Van Ness and Abbott)

Report details

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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/chemical/separation/activity-margules

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.