

Thermodynamics (Classical) for Biological Systems

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Self Evaluation Questions

The students can use the following questions to check their understanding of the material presented in the course. If something is unclear, they can go back to the relevant lectures and clarify themselves. The questions are arranged, module-wise, including the introductory module.

Module 4 Thermodynamics of Solutions

1. What are perfect mixtures of gases? What are imperfect gas mixtures?
2. Compare and contrast the chemical potential formulations for the following substances (a) ideal gas solution (b) real gas solution (c) ideal solutions of liquids or solids (d) real solutions of liquids or solids
3. What is Lewis and Randall rule? How is it helpful?
4. What is the need to define partial molar properties? What are they?
5. How does one estimate partial molar volumes for a binary mixture from the data from mixing experiments?
6. What are excess properties? What is the equivalent for the excess property in the context of pure substances?

7. What is the relevance of the following models (a) Margules model (b) Van Laar model (c) Wilson model? Which systems can they be applied to?

8. What is infinite dilution? What is the relationship between the above model constants and the corresponding activity coefficients at infinite dilution?

9. How does one estimate activity coefficients from the above models? Give one example.