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 2 Additional Thermodynamic Functions

1. Why are H, A, and G considered `additional' Thermodynamic functions?

2. How are H, A, and G defined in terms of previously known Thermodynamic properties?

3. `State' functions are not dependent on the path followed between the two states of relevance – explain.

4. What are the general equations valid for a closed system consisting of a pure component existing in a single-phase? How are they derived?

5. How do the equations above change when multiple components are present, in a single-phase system?

6. What is chemical potential?

7. What is the significance of the Gibbs-Duhem equation?

8. How does one arrive at the Maxwell's relations? What are the Maxwell's relations for a multi-component, single-phase system? How can they be used?

9. What are heat capacities, expansivity, and compressibility? How can they be used?

10. What is your understanding of the following mathematical manipulations? (a) change of variable (b) cyclic transformation

11. When does one obtain maximum work out of a system? What is lost work?

12. What is the form of the energy conservation equation that is most useful for a flow system?