

Thermodynamics

Introducing

Description

Fundamental concepts (concept of systems, evolution of a system, mathematical tools in thermodynamics, ideal gas model). Work and heat. The first law of thermodynamics and the internal energy function. The enthalpy function and the steady-state systems. Thermodynamic functions changes during reactions. Thermodynamic machines (heat engines).

Objectives

At the end of this module, students should have understood and be able to explain:

- the inductive approach, specific to thermodynamics, which is to generalize, by defining them as laws, the conditions for energy conservation and evolution of systems;
- the significance, the relevance and the application areas of the main thermodynamic functions (internal energy, enthalpy, entropy and Gibbs function).

Students should be able to:

- identify the system under study and to establish, for this system, routinely and systematically, the material balance, the energy balance and the balance of entropy;
 - explain the operation of thermodynamic machines, based on the two laws of thermodynamics and on phases equilibria.
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Necessary prerequisites

Math: Concept of function of several variables and partial derivatives.

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

 Toulouse