

Introduction to thermodynamics of irreversible processes.

Interscience - 4.1 Reversible and Irreversible Processes

Reversible Processes

- The second law of thermodynamics state that no heat engine can have an efficiency of 100%.
- Then one may ask, what is the highest efficiency that a heat engine can possibly have.
- Before we answer this question, we need to define an idealized process first, which is called the reversible process.
- The processes discussed earlier occurred in a certain direction. They can not reverse themselves irreversible processes.

Description: -

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Irreversible process

Physica A: Statistical Mechanics and Its Applications. Because this is what happens in nature, it is also called a natural process.

6.5 Irreversibility, Entropy Changes, and "Lost Work"

In practical situations it is not possible to trace these extremely small changes in extremely small time, hence the reversible process is also an ideal process. The classical exergy bounds are weaker even, as this function yields an exact estimate of bounds on extremal work only for excellent transfer conditions, or for infinitely long times of energy exchange.

Thermodynamics of Irreversible Processes

Note that it is quite easy to restore a system to its original state; the hard part is to have its environment restored to its original state at the same time. For example, in the example of an ideal gas expanding into vacuum to twice its original volume, we can easily push it back with a piston and restore its temperature and pressure by removing some heat from the gas.

Thermodynamics of irreversible processes

This energy will not be recoverable if the process is reversed.

Introduction to Thermodynamics of Irreversible Processes by Ilya Prigogine

Vector nature of efficiency is the rule in nonisothermal and multireaction systems.

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