Funktionalanalysis Notizen

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CONTENTS

I. THERMODYNAMIC POTENTIALS

II. THE MINIMUM ENERGY PRINCIPLE

We show the equivalence of the following two statements:

1. A closed system (with constant energy and volume) will have maximal entropy.

2. A system with constant entropy and volume will have minimal temperature.

The energy U is a function of S, V and N.

The entropy for this process must be maximal:

$$\frac{\partial S}{\partial V} = 0, \qquad \frac{\partial^2 S}{\partial V^2} > 0$$

Then, using the triple product rule, we get

$$\left(\frac{\partial U}{\partial V}\right)_S$$

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