

## 12.2: Free Energy

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We shall be learning that there are two sorts of *free energy*.

There is the *Helmholtz free energy*. Commonly used symbols for this are  $A$  (from the German *die Arbeit* – work) or  $F$ .

And there is the *Gibbs free energy*. Commonly used symbols for this are  $G$  – or  $F$ !

It is unfortunate that some writers will use simply the term "free energy", using the symbol  $F$ , without specifying which, or even giving evidence that they are aware of the difference. I have seen the symbol  $F$  used about equally often for Helmholtz, Gibbs or unspecified free energies.

In these notes I shall use the symbol  $A$  for the Helmholtz free energy and  $G$  for the Gibbs free energy, and I shall avoid the symbol  $F$ .

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