

Gibbs Free Energy

Chemistry

The equation that decides whether a reaction is feasible.

A reaction is thermodynamically feasible when the Gibbs free energy change is negative.

$$\Delta G = \Delta H - T\Delta S$$

ΔH negative, ΔS positive

Both terms help.

Always feasible

ΔH positive, ΔS negative

Never feasible

ΔH positive, ΔS positive

$T\Delta S$ must exceed ΔH .

Feasible at high T

THE COMMON MISTAKE

✗ **Reading feasible as 'will happen'**

✓ **Feasible means thermodynamically allowed**

Kinetics decides whether it happens at a useful rate. Diamond to graphite is feasible and takes geological time.

ΔS must be in $\text{J K}^{-1} \text{mol}^{-1}$ and ΔH in kJ mol^{-1} — divide ΔS by 1000 before substituting. It is the commonest error.