Chemical Thermodynamics

State Functions

- Table of differential functions

State Function	Differential	Significance	path
U			
H			
G			
A			

Maxwell relations

- Since each of the state functions are exact more relationships can be derived.

State Function	Differential	Maxwell
U		
H		
G		
A		

Example

- Calculate DU for the expansion of 1 mole of NH3 from T_1 = 300 K, V_1 = 0.30 L to T_2 = 200 K, V_2 = 0.60 L. Assume van der Waals behavior.

Example

- Four step process
  - 1.
  - 2.
  - 3.
  - 4.

Example

- Continue using the van der Waals equation

Example

- What is ΔS for the same process?

Example

- What is ΔS for the same process?

Example

- What about ΔH?