

Title	Demonstrate knowledge of thermodynamics		
Level	5	Credits	3

Purpose	People credited with this unit standard are able to: define thermodynamic quantities; and use them in calculations.
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Classification	Science > Chemistry
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Available grade	Achieved
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Guidance Information

- All work must be carried out in accordance with the quality management system, documented protocol system or Standard Operating Procedures typically acceptable in a commercial or research laboratory.
- Health and Safety practices must conform to Australian/New Zealand Standard AS/NZS 2243:2010 Set – Safety in Laboratories, available at <http://www.standards.co.nz> and <http://infostore.saiglobal.com/store>.
- Legislation applicable to this unit standard includes:
Health and Safety at Work Act 2015;
Hazardous Substances and New Organisms Act 1996.

Outcomes and performance criteria

Outcome 1

Define thermodynamic quantities.

Performance criteria

- Enthalpy changes are defined under standard conditions.

Range	combustion, formation, solution, vaporisation, reaction, fusion, sublimation.
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- Entropy and free energy are defined under standard conditions.

Outcome 2

Use thermodynamic quantities in calculations.

Performance criteria

- 2.1 Calculations involving $\Delta G = \Delta H - T\Delta S$ are consistent with algebraic processes and required values.
- 2.2 Calculations involving $\Delta G = -RT \ln K$ are consistent with algebraic processes and required values.
- 2.3 The variation of equilibrium constant K with temperature is calculated using a fixed value for the enthalpy change.
- Range Clausius-Clapeyron equation.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	22 December 1996	31 December 2014
Revision	2	19 February 1998	31 December 2014
Review	3	23 November 1999	31 December 2014
Review	4	18 June 2010	31 December 2022
Rollover	5	27 January 2015	31 December 2022
Rollover and Revision	6	15 June 2017	31 December 2022
Revision	7	26 October 2017	31 December 2022
Review	8	22 October 2020	31 December 2022

Consent and Moderation Requirements (CMR) reference

0113

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.