

<b>Title</b>	<b>Demonstrate laboratory solvent and distillation separation techniques</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	People credited with this unit standard are able to: separate a component from a mixture using techniques of solvent extraction; purify a substance by recrystallisation; describe the use of a phase diagram to predict fractional distillation behaviour; and separate a component from a mixture by distillation.
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<b>Classification</b>	Science > Chemistry
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<b>Available grade</b>	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 (SOP) 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.
- Knowledge underpinning the competencies in this unit standard includes an outline of partition theory.
- Glossary  
*Laboratory procedures* refer to documented systems or processes of operation, which may be found in a SOP manual, quality management system or protocol system documentation. These procedures are external and/or internal laboratory requirements governing laboratory work.

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### Outcomes and performance criteria

#### Outcome 1

Separate a component from a mixture using techniques of solvent extraction.

Range Soxhlet extractor, separating funnel.

**Performance criteria**

- 1.1 Separation by solvent extraction is carried out in accordance with laboratory procedures.
- 1.2 Amount of separated component is determined and is consistent with expected yield.

**Outcome 2**

Purify a substance by recrystallisation.

**Performance criteria**

- 2.1 Recrystallisation is carried out and melting point is determined in accordance with laboratory procedures.
- 2.2 Yield and purity are calculated and are consistent with sample and technique.

**Outcome 3**

Describe the use of a phase diagram to predict fractional distillation behaviour.

Range ideal systems, non-ideal systems.

**Performance criteria**

- 3.1 Solutions are described in terms of Raoult's Law and azeotropic behaviour.
- 3.2 Phase diagram is described to predict fractional distillation behaviour systems.

**Outcome 4**

Separate a component from a mixture by distillation.

Range simple, fractional.

**Performance criteria**

- 4.1 Separation by distillation is carried out in accordance with laboratory procedures.
- 4.2 Amount of separated component is determined and is consistent with expected yield.

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**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	24 September 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

<b>Consent and Moderation Requirements (CMR) reference</b>	0113
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.