



Higher National unit specification

General information

Unit title: Aromatherapy Chemistry (SCQF level 8)

Unit code: HL91 35

Superclass: HK

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Version: 01

Unit purpose

This unit is designed to give the learner the knowledge of chemistry and related theory to the study of Aromatherapy. This unit should be delivered in conjunction with the HN unit Aromatherapy, Aromatherapy Massage Advanced Aromatherapy and/or Botanical Sciences for Aromatherapy.

Outcomes

On successful completion of the unit the learner will be able to:

- 1 Explain the principles of organic chemistry.
- 2 Identify and describe chemical compounds that occur in volatile oils and fixed oils used in Aromatherapy.
- 3 Explain the pharmacological actions (pharmacognosy) of volatile and fixed oils used in Aromatherapy.
- 4 Describe Methods of Essential Oil Quality Control.

Credit points and level

1 Higher National unit credit at SCQF level 8: (8 SCQF credit points at SCQF level 8)

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Recommended entry to the unit

It is recommended that the learner has knowledge of basic chemistry which may be evidenced by an Access to Chemistry or Intermediate 2 Chemistry qualification or above. Learners should have undertaken the HN unit Aromatherapy Massage at level 7. This unit is an optional unit within the HNC Complementary Therapy qualifications.

Core Skills

There is no automatic certification of Core Skills or Core Skill components in this unit.

Context for delivery

If this unit is delivered as part of a group award, it is recommended that it should be taught and assessed within the subject area of the group award to which it contributes.

Equality and inclusion

This unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

Higher National unit specification: Statement of standards

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Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Where evidence for outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Learners should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Explain the principles of organic chemistry.

Knowledge and/or Skills

- ◆ Molecular formulae
- ◆ The formation of key hydrocarbons found in essential oils,
- ◆ The formation long chain fatty acids, found in fixed oils
- ◆ Structural and geometric isomerism

Outcome 2

Identify and describe chemical compounds that occur in volatile oils and fixed oils used in Aromatherapy.

Knowledge and/or Skills

- ◆ Key hydrocarbons, their range and diversity
- ◆ Principles of chemo types
- ◆ Key fatty acids, their range and diversity

Outcome 3

Explain the pharmacological actions (pharmacognosy) of volatile and fixed oils used in Aromatherapy.

Knowledge and/or Skills

- ◆ Pharmacodynamics of volatile and fixed oils used in aromatherapy.
- ◆ Pharmacokinetic actions of volatile and fixed oils used in aromatherapy.
- ◆ Safety issues concerning properties and actions of volatile and fixed oil constituents

Higher National unit specification: Statement of standards (cont)

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Outcome 4

Describe Methods of Essential Oil Quality Control.

Knowledge and/or Skills

- ◆ The importance for analysis and quality control of essential oils
- ◆ Qualitative and Quantitative analysis
- ◆ Chromatography (TLC, HPLC and GLC)
- ◆ Mass Spectrometry (GC-MS)
- ◆ Infrared Spectroscopy
- ◆ Optical rotation
- ◆ Specific gravity
- ◆ Refractive index
- ◆ Sensory detection

Evidence requirements for this unit

Learners will provide evidence to demonstrate their Knowledge and/or Skills across all outcomes.

Outcome 1

Learners will demonstrate that they are able to explain:

- ◆ molecular formulae.
- ◆ the formation of hydrocarbons:
 - the isoprene sub-unit in relation to the formation of hydrocarbons
 - the formation of terpenoid and phenylpropanoid structures
 - identify functional groups.
- ◆ the formation of long chain fatty acids:
 - the structure of long chain fatty acids
 - saturated and unsaturated fats in fixed oils.
- ◆ molecular structure with regards to geometric isomerism.

outcome 2

Learners will demonstrate that they can:

- ◆ identify and describe key hydrocarbons, their range and diversity:
 - key chemical families.
- ◆ explain the principles of chemo types.
- ◆ identify and describe key fatty acids within fixed oils.

Higher National unit specification: Statement of standards (cont)

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Outcome 3

Learners will demonstrate that they can explain:

- ◆ the basic principles of pharmacodynamics of volatile and fixed oils used in aromatherapy.
- ◆ the basic principles of pharmacokinetic actions of volatile and fixed oils used in aromatherapy.
- ◆ the safety issues concerning properties and actions of volatile and fixed oil constituents.

Outcome 4

The learner will provide evidence that they can describe:

- ◆ and explain the importance for quality control of essential oils.
- ◆ the methods of essential oil analysis.
- ◆ the benefits and drawbacks of methods of analysis of essential oils.
- ◆ and perform thin layer or paper chromatography of a plant extract.



Higher National unit support notes

Unit title: Aromatherapy Chemistry (SCQF level 8)

Unit support notes are offered as guidance and are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this unit

This unit is intended for delivery as part of the HND Complementary Therapies group award. It is designed to expand the learner's knowledge and understanding with regards to the chemical constituents governing the pharmacological properties of essential oils and fixed oils as used in Aromatherapy. It is suggested that this unit is delivered following Aromatherapy Massage HF7T 34 at level 7 and in conjunction with Aromatherapy: Advanced at level 8 and Botanical Science for Aromatherapy at level 8.

Outcome 1 and Outcome 2 examines the basics of molecular structure and introduces an appreciation of the complexity and variation of the chemical constituents that make up essential oils and fixed oils used in aromatherapy treatments.

Outcome 3 will examine the pharmacological effects that the chemical constituents within essential and fixed oils, individually and in combination, have on biological function.

The study of pharmacodynamics of essential and fixed oils will allow the learner to understand the biochemical and physiological effects on the body. Pharmacokinetics will allow the learner to understand how the constituents of the oils move through the body including absorption, biotransformation and excretion. Safety issues surrounding the use of essential and fixed oils will be discussed including safety data regarding toxicity and sensitisation.

Outcome 3 is intended to expand the learner's knowledge of properties of essential and carrier oils gained in the unit Aromatherapy Massage and will complement knowledge and skills in the units Aromatherapy: Advanced and Botanical Science for Aromatherapy.

Outcome 4 will introduce various methods of essential oil analysis. This outcome will highlight the importance of quality control in essential and fixed oils used in aromatherapy treatments. The various types of analysis will be discussed in terms of the methods and equipment used, the information gained from each and the significance of the data found.

Higher National unit support notes (cont)

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Guidance on approaches to delivery of this unit

Outcome 1 should be delivered in conjunction with Outcome 2 to allow for the natural flow of understanding from the basics of molecular structure to the complexity of the many and varied chemical constituents that make up essential oils and fixed oils used in aromatherapy treatments. Learners could be shown how to build models showing molecular structure. For example, building isoprene units to show how they can be joined to form key hydrocarbons found in essential oils. The structure of simple long chain fatty acids could be demonstrated in a similar way. The molecular structure of waxes could be introduced for comparison.

Essential oils: Chemical families should include; Alkanes, Cycloalkanes, Alkenes, Alkynes, Alkanols, including: Terpenes, monoterpenes, sesquiterpenes and diterpenes, Alcohols, monoterpenols, sesquiterpenols. Ester, Ethers, Aldehydes, Ketones, Phenols, Lactones and Coumarins, Oxides.

Fixed oils: Saturated and unsaturated, poly and monounsaturates.
Including; Monounsaturates, palmitoleic acid
Polyunsaturates; linoleic acid, linolenic acid, gamma linolenic acid,
Saturates; stearic acid, palmitic acid, myristic acid, lauric acid

Outcome 3 May be delivered separately, or in conjunction with the appropriate skills and knowledge within the unit Advanced Aromatherapy, relating to safety data, toxicity, contraindications, special care, synergy, properties and uses of essential and fixed oils used in Aromatherapy. Irritant, sensitisation, photosensitivity and toxicity of constituents should be interrelated, but is expanded upon in the units Aromatherapy Massage and Aromatherapy: Advanced. This should be linked to COSHH risk assessment for discussion, however the use of COSHH risk assessment is assessed within the unit Complementary Therapies: Health and Safety Legislation at level 7.

Outcome 4

Learners should be introduced to a variety of current methods of essential oil chemical analysis. If the facilities of the centre allow, the learners may be instructed on how to perform an appropriate method of analysis of an extract. If centre facilities are not equipped with appropriate apparatus for essential oils analysis, visits to laboratories that use some of these methods could be arranged, or simplified lab versions demonstrated. Videos can be used to illustrate the theory where demonstration is not possible. Learners should be familiar with the output from each method (chromatograms etc) and an example of how to interpret simple spectra of the chosen methods.

Guidance on approaches to assessment of this unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

Higher National unit support notes (cont)

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- ◆ Outcome 1 will be assessed alongside outcome 2 by means of open-book questions and research to show evidence devised to demonstrate knowledge to the meet evidence requirements
- ◆ Outcomes 1 and 2 should be assessed by a combination of directed open-book questions and research to show evidence. Diagrams, practical model making, or recognition of 3D models representing a sample from the molecular structures familiar to the learner may be included as part of the open-book questions for diverse means of assessment.
- ◆ Outcome 3 should be assessed by an open-book report. The contents of the report should be assessor devised, directed questions, or tasks based on the evidence requirements.
- ◆ Outcome 4 will be assessed by means of an open-book report to demonstrate an understanding of the evidence requirements.
- ◆ The learner should be given assessor devised, directed questions, or tasks based on the evidence requirements.
- ◆ The questions/tasks should allow the learner to demonstrate their knowledge of the evidence requirements.
- ◆ The learner's work should be recorded with the use of an assessor's devised checklist which should be retained with the learner's submitted work.
- ◆ The researched reports for outcomes 1-4 should be referenced using the Harvard referencing system

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the evidence requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at www.sqa.org.uk/e-assessment.

Higher National unit support notes (cont)

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Opportunities for developing Core and other essential skills

A range of complex source materials should be analysed and key points could be identified, evaluated and summarised. Written reports should express essential complex ideas and information accurately and coherently, be formally structured and use accurate language, spelling, punctuation and syntax. Use of up to date software packages and templates could support the development of writing skills. The use of skills checklists and production of drafts will ensure assessor involvement at all stages of writing and support the development of communication skills.

Use of up to date software packages for word processing and editing where practical could support the development of writing skills. The production of early drafts of notes will ensure assessor involvement at all stages of writing and support the development of communication skills.

Aspects *Problem Solving*, that is, Planning and Organising, Critical Thinking, and Reviewing and Evaluating, will be naturally developed as the aromatherapy massage treatment is planned and safely undertaken. In planning the treatment learners will identify and analyse a range of factors including suitable products and techniques to ensure the treatment meets the needs of each individual client. The treatment application must ensure client comfort and safety. Taking account of timing sequence and duration will require good planning and organising skills. Compliance with health and safety legislation is integral to achievement. Analytical evaluation of the effectiveness of treatments in relation to identified aims could be enhanced by formative group discussion.

In addition to the specific vocational skills developed and assessed learners will have the opportunity to develop generic skills which will enhance their employability skills profile, customer care skills, communication skills, time management.

History of changes to unit

Version	Description of change	Date

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General information for learners

Unit title: Aromatherapy Chemistry (SCQF level 8)

This section will help you decide whether this is the unit for you by explaining what the unit is about, what you should know or be able to do before you start, what you will need to do during the unit and opportunities for further learning and employment.

This unit is designed to give you the knowledge of the chemistry and related theory to the study of Aromatherapy. You will learn more about the key chemical constituents that make up essential and carrier oils including basic biochemical effects, toxicity and safety issues, quality control and methods of essential oil analysis.

You will be assessed by means of a combination of open-book questions and a researched report. Your submitted work will be assessed and retained by your assessor.

On completion of the unit you should be able to:

- ◆ explain the basic principles of organic chemistry.
- ◆ identify and describe chemical compounds that occur in volatile oils and fixed oils used in Aromatherapy.
- ◆ explain the pharmacological actions (pharmacognosy) of volatile and fixed oils used in Aromatherapy.
- ◆ describe Methods of Essential Oil Quality.

This unit is designed to expand on existing aromatherapy knowledge and skills. The knowledge and skills gained in this unit are further explored in the units Aromatherapy Massage, Botanical Science for Aromatherapy and Aromatherapy: Advanced.