Chemistry of hair and beauty products

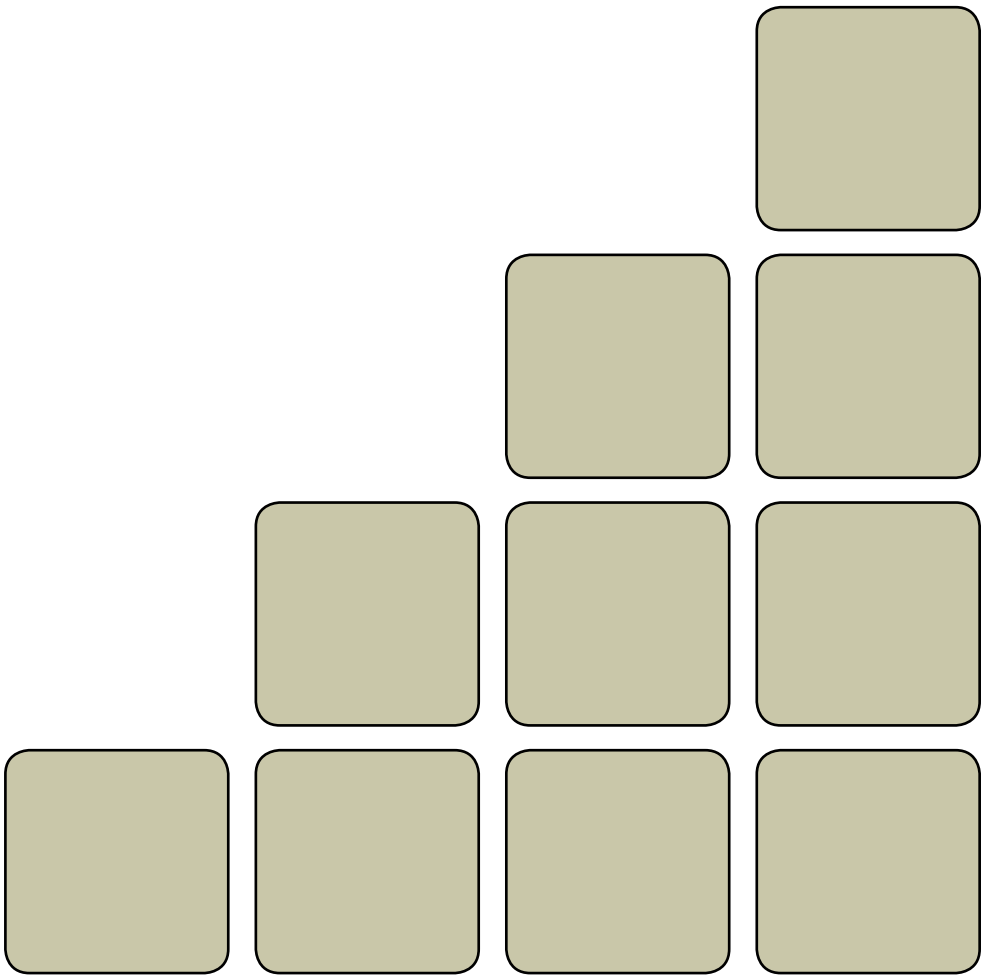
UV40461

K/601/5346

Learner name:

Learner number:

VRQ



VTCT is the specialist awarding body for the Hairdressing, Beauty Therapy, Complementary Therapy and Sport and Active Leisure sectors, with over 45 years of experience.

VTCT is an awarding body regulated by national organisations including Ofqual, SQA, DCELLS and CCEA.

VTCT is a registered charity investing in education and skills but also giving to good causes in the area of facial disfigurement.

Statement of unit achievement

By signing this statement of unit achievement you are confirming that all learning outcomes, assessment criteria and range statements have been achieved under specified conditions and that the evidence gathered is authentic.

This statement of unit achievement table must be completed prior to claiming certification.

Unit code	Date achieved	Learner signature	Assessor initials	IV signature (if sampled)

Assessor tracking table

All assessors using this Record of Assessment book must complete this table. This is required for verification purposes.

Assessor name	Assessor signature	Assessors initials	Assessor number (optional)

UV40461

Chemistry of hair and beauty products

This unit is about developing an understanding relating to the chemistry of products used in the hair and beauty sector through theoretical research.

You will explore the chemistry of active ingredients, the effects and safe use of active ingredients, the properties of packaging materials in relation to their structure, the properties and effects of ultra-violet radiation on hair and beauty products and their packaging materials.

This unit is underpinned by both health and safety working practices and the identification of client contra-indications.

This unit is suitable for hairdressers, barbers and beauty therapists.

Level

4

Credit value

14

GLH

75

Observations

0

External paper(s)

0

Chemistry of hair and beauty products

Learning outcomes

On completion of this unit you will:

1. Understand the chemistry of active ingredients in hair and beauty products
2. Understand the effects and safe use of active ingredients in hair and beauty products
3. Understand the properties of packaging materials in relation to their structure
4. Understand the properties and effects of ultra-violet radiation on hair and beauty products and their packaging materials

Evidence requirements

1. *Knowledge outcomes*
   There must be evidence that you possess all the knowledge and understanding listed in the 'Knowledge' section of this unit. This evidence may include projects, assignments, case studies, reflective accounts, oral/written questioning and/or other forms of evidence.
2. *Tutor/Assessor guidance*
   You will be guided by your tutor/assessor on how to achieve learning outcomes in this unit. All outcomes must be achieved.
3. *External paper*
   There is no external paper requirement for this unit.

Developing knowledge

Achieving knowledge outcomes

You will be guided by your tutor and assessor on the evidence that needs to be produced. Your knowledge and understanding will be assessed using the assessment methods listed below:

- Observed work
- Witness statements
- Audio-visual media
- Evidence of prior learning or attainment
- Written questions
- Oral questions
- Assignments
- Case studies

Where possible your assessor will integrate knowledge outcomes into practical observations through oral questioning.

Knowledge

Outcome 1

Understand the chemistry of active ingredients in hair and beauty products

You can:	Portfolio reference / Assessor initials*
a. Explain the differences between chemical compounds found in hair and beauty products	
b. Explain the chemical reaction process that occurs in ingredients found in hair and beauty products and their effects on the hair and scalp	
c. Describe the active ingredients found in different hair and beauty products	
d. Explain the effect of functional groups on the reactivity of molecules in products	

** Assessor initials to be inserted if orally questioned.*

Requirements highlighted in white are assessed in the external paper.

Outcome 2

Understand the effects and safe use of active ingredients in hair and beauty products

You can:	Portfolio reference / Assessor initials*
a. Explain the desired effects of products in relation to their chemical composition	
b. Explain how to follow safe working practices with regard to contra-indications presented by the client	
c. Explain how to follow safe working practices with regard to the storage, handling and application of hair and beauty products	
d. Identify the organisations responsible for monitoring the safety, standardisation and Lethal Dose (LD 50) testing of hair and beauty products	
e. Explain the problems associated with the use of oils as active ingredients	

** Assessor initials to be inserted if orally questioned.*

Requirements highlighted in white are assessed in the external paper.

Outcome 3

Understand the properties of packaging materials in relation to their structure

You can:	Portfolio reference / Assessor initials*
a. Explain the chemical properties of packaging materials in relation to their chemical structure	
b. Explain the effects of tensile and compressive forces on metals, glasses, elastomers, thermoplastics, thermosets and ceramics, fibrous materials	
c. Explain the effects of shape and temperature on the properties of packaging materials	

** Assessor initials to be inserted if orally questioned.*

Requirements highlighted in white are assessed in the external paper.

Outcome 4

Understand the properties and effects of ultra-violet radiation on hair and beauty products and their packaging materials

You can:	Portfolio reference / Assessor initials*
a. Explain the properties and categories of ultra-violet radiation	
b. Explain how ultra-violet radiation can affect the chemical composition of hair and beauty products	
c. Explain how the exposure and transmission of ultra-violet radiation can affect packaging materials for hair and beauty products	

** Assessor initials to be inserted if orally questioned.*

Requirements highlighted in white are assessed in the external paper.

Unit content

This section provides guidance on the recommended knowledge and skills required to enable you to achieve each of the learning outcomes in this unit. Your tutor/assessor will ensure you have the opportunity to cover all of the unit content.

Outcome 1: Understand the chemistry of active ingredients in hair and beauty products

Chemical compounds found in hair and beauty products: Solids, liquids, gases, states of matter, atoms, molecules, oils, fats, waxes, animal, vegetable, mineral, aromatherapy blends, synthetic waxes, carnauba, hydrogen peroxide, lanolin, isopropyl alcohol, mineral oil, polyethylene glycol (PEG), propylene glycol (PG), sodium lauryl sulphate (SLS) and sodium laureth sulphate (SLES), diethanolamine (DEA), monoethanolamine (MEA), triethanolamine (TEA), FD&C pigments, amino compounds, 4-amino-2-hydroxytoluene and m-aminophenol, ammonium thioglycolate, sodium bromate, paraphenylenediamine, metal oxides, titanium dioxide, iron oxide, formaldehyde, material safety data sheets, pH scale, acids, alkaline, malic acid, lactic acid, citric acid, tartaric acid, glycolic acid, salicylic acid, AHAs, BHA's, DHA.

Active ingredients found in different hair and beauty products: Pigment molecules, temporary hair colour, semi-permanent hair dye, quasi-permanent hair colour, permanent hair colour, molecular structure, developer, peroxide, alkaline agent, ethanolamine, sodium carbonate, hydrogen peroxide, developer, oxidising agent, ammonia, chemical reaction, hair shaft, cuticle layer, cortex, melanin, bleaching, vegetable tinting gels, 3% (10 volume), 6% (20 volume), 12% (30 volume), cream/liquid.

Effect of functional groups on the reactivity of a molecule in products: Structure, properties, composition, reactions, esters, organic compounds, carbon-based compounds, hydrocarbons, derivatives, concept of functional groups, organic chemistry, classification of structures, properties, molecular module, chemical properties of organic compounds, physical properties of organic compounds, alcohols, hydrophilic, hydrophobic.

Outcome 2: Understand the effects and safe use of active ingredients in hair and beauty products

Desired effects of products in relation to their chemical composition: Evaporation, condensing, sublimation, melting, freezing, hydrogen peroxide (H_2O_2), oxidising properties, anti-oxidising properties, softening/moulding/fixing, bleaching agent, disinfectant, antiseptic, oxidiser, reactive oxygen species, potassium chloride, potassium, chlorine, sodium chloride, volatile, flammable, isopropyl alcohol.

Safe working practices with regard to contra-indications presented by the client: Consultation techniques, record keeping, data protection, patch testing, tested area, timing, allergic reaction, subsequent action, contra-actions.

Safe working practices with regard to the storage, handling and application of hair and beauty products: Control of Substances Hazardous to Health Regulations, manual safety data sheets, storage, handling, disposal, record keeping.

Organisations responsible for monitoring the safety, standardisation and Lethal Dose (LD 50) testing of hair and beauty products: EU legislation on cosmetics, scientific committee on consumer products, safety assessments, US food and drug administration (FDA), International co-operation on cosmetics.

Use of oils as active ingredients: Volatile, carrier oils, blends, irritation, softens, replaces moisture, allergic reaction, photosensitises, manual safety data sheets, contra-indications.

Outcome 3: Understand the properties of packaging materials in relation to their structure

Chemical properties of packaging materials in relation to their structure: Barcode, ingredients, expiry date, batch code, containers, quality of the material, weight, dimensions, volume, microbiological tests, form, colour, smell and clarity, solubility, viscosity.

Tensile and compressive forces on metals, glasses, elastomers, thermoplastics, thermo sets and ceramics, fibrous materials: Tensile strength, resistance to force, size, compressive strength, crushes or buckles.

Shape and temperature on the properties of packaging materials: Laminate films, chemical adhesives, ultrasonic welding, heat sealing, impulse heat sealing (IHS), hot air welding, seal to sustain the required loads, polymers, pressure, and adhesion.

Outcome 4: Understand the properties and effects of ultra-violet radiation on hair and beauty products and their packaging materials

Properties and categories of ultra-violet radiation: Electromagnetic spectrum, Ultraviolet light, violet light, UV-A, UV-B, UV-C, steriliser, ozone, vitamin D production.

Ultra-violet radiation can affect the chemical composition of hair and beauty products: Alpha hydroxy acid (AHAs), UV rays, titanium dioxide, pigment, UV absorber, UV curing, liquid to solid phase, polymerisation, monomers.

Ultra-violet radiation and the effect on packaging materials for hair and beauty products: Short-wave UV radiation, germicidal effect, micro-organisms, viruses, bacteria, yeasts, economical, environmentally friendly, product shelf life, chemical reaction in medical materials, polymer, flexible films, foils.

Notes

Use this area for making notes and drawing diagrams