Field of action	Working in the laboratory				
Learning outcome unit	1 - Separating and mixing substances				
EQF level	**Competence level A:** EQF level 3 **Competence level B:** EQF level 4				
Relations to national qualifications	**BG**	**CZ**	**DE**	**IT**	**SK**
		Chemical technician, chemical laboratory technician	Chemical laboratory technician, chemical technician, physics laboratory technician	Biochemical technician	Chemical technician / chemical laboratory technician, chemical technology modeller, chemical laboratory assistant

Learning outcomes

Competence[1]	Skills	Knowledge
<u>Competence level A</u> **(EQF level 3)** - separates and mixes substances by using the standard methods and adapts these methods to the given conditions (selects methods depending on the properties of the substances)	- accepts orders for separating and mixing substances and plans all further processing steps until supplying the result - selects methods, respective laboratory equipment and necessary chemicals (solvents…) and handles them accurately, carefully and expertly	- knows chemicals (properties, structure, R/S statements) - knows principles of separating/mixing and respective methods (knows steps of action) - knows respective equipment and its functioning/ operation
<u>Competence level B:</u> **(EQF level 4)** - deals with problems typical for the methods	- analyses the problem, develops solution approaches by applying specialist knowledge and decides how to solve the problem - reflects on whether the problem was actually solved	- knows processes which the methods are based on - knows structural characteristics which are responsible for behaviour/ properties of a substance - knows solubilities of substances at different temperatures

[1] The competence levels build upon each other.

Field of action	Working in the laboratory				
Learning outcome unit	**1 - Separating and mixing substances**				**LEE 1**
Countries	**BG**	**CZ**	**DE**	**IT**	**SK**
Which CREDCHEM learning place offers the learning outcome unit?	-	Chemical College Pardubice	Saxon Education Company for Environmental Protection and Chemical Occupations Dresden ltd.	ITAS Scalcerle	Secondary Technical School Bratislava, Secondary Technical School Novaky
How many learners can be admitted?		3	3-4	12	10
At which competence level is the learning outcome unit offered?		A, B	A	A, B	A, B
In which language is the mobility taught?		English	English/German	English	English/German
Which methods are used?		Extraction Distillation Filtration Recrystallisation Preparation of solutions of solid and solvent			

The following occupational tasks[2] (which can also be used for imparting the learning outcomes) have been exemplarily analysed in preparing the LEE:
Extraction of copper sulphate
Extraction of caffeine
Rectification of trichloromethane
Sedimentation
Alcoholic fermentation and distillation
Filtration of calcium carbonate
Preparation of a sodium hydroxide titrant
Recrystallisation of sulphanilic acid
Recrystallisation of copper sulphate

[2] Occupational and examination tasks can be downloaded at www.credchem.eu.

Steam distillation of toluene	
Grinding and sieve analysis	
Mixing	
The following examination tasks were designed for the competence levels indicated:	***Competence level***
Extraction of copper sulphate	A, B
Extraction of caffeine	A, B, C
Alcoholic fermentation and distillation	A, B, C
Rectification of trichloromethane	A, B, C
Filtration of calcium carbonate	A, B
Preparation of a sodium hydroxide titrant	A, B
Recrystallisation of copper sulphate	A, B
Steam distillation of toluene	A, B