

CONVOCATORIA DE PRÁCTICAS INTERNACIONALES/ CALL FOR INTERNATIONAL INTERNSHIP

CONVENIO CEBE 2021 / CEBE 2021 AGREEMENT

I. HOST APPLICANT INFORMATION

This person is responsible for signing the Learning Agreement, amending it if needed, supervising the trainee during the traineeship and signing the Traineeship Certificate.

Department/Faculty. Institution	Department of Chemistry/Royal Military Academy				
Organization Type (see annex I)	EPLUS-EDU-HEI				
Public body	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Non-Profit	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Size	<input type="checkbox"/> < 250 employees <input type="checkbox"/> >250 employees
Address; website	Avenue Renaissance 30, 1000 Brussels, Belgium http://www.rma.ac.be/fr/				

II. PROJECT DESCRIPTION

Description of the project that will be done by the student-trainee at the host institution.

Wished period for mobility ⁽¹⁾ : from (day/month/year) 15/09/2022 to (day/month/year) 14/12/2022
1. Project title: Improving the performance of respiratory gas filters in real conditions
2. Number of working hours per week: 35

3. Detailed programme of the traineeship ⁽²⁾ (max. 300 words):

Context: Modeling gas phase adsorption on activated carbon filters is necessary, especially for the protection of people in toxic environments. In these cases, it is of the utmost importance to estimate the time that the person is protected, i.e. how long it is safe to stay in a harmful atmosphere before the filter loses its functionality. This protection time is known as the breakthrough time of the filter. In this regard, the existing models only yield good estimations within a very restrictive set of boundary conditions. The aim of this study is to develop a model that works in a more realistic environment, accounting for factors such as chemisorption, sequential adsorption or the influence of temperature.

Approach: Gas breakthrough time experiments with activated carbons will be performed under different experimental conditions in a dynamic sorption equipment. On the one hand, the influence of the temperature on the sorption of organic vapours and inorganic gases will be evaluated. Also, the performance of the filter against the sequential adsorption of toxic substances will be assessed. The characterization of the materials before and after the different experiments will consist of gas sorption isotherms, TG-MS, SEM-EDX and will allow to identify the nature of the remaining adsorbed species and their location within the pore network, thus contributing to unravel the sorption mechanisms. Once the results are collected for each of the research fronts, they will be used to enhance the predictive modeling tool.

Role of the trainee: the trainee will participate in the activities above described in the frame of a project funded by the Belgian Defense (MSP21/07, 2021-2024). Besides from the experimental work, the trainee will also participate in the bibliographic search, the interpretation and discussion of the results, and the drafting of reports and/or presentations.

4. Knowledge, skills and competences to be acquired by the end of the traineeship (expected Learning Outcomes)(max 100 words):

- Knowledge on activated carbons, mainly on their porous and surface properties and their use as sorbents in air filtration.
- Acquiring expertise in different characterization techniques and gas breakthrough experiments.
- Gaining knowledge on the interpretation and discussion of scientific results, as well as in the writing of scientific reports.
- Learning how to work in a research laboratory, in team and in the frame of an on-going project.
- Improving the communication skills and knowledge of languages (the trainee will have the opportunity to learn French/Flemish).

5. Monitoring plan (max 100 words):

Regarding the experimental part, and since the trainee will be integrated in the routine tasks of an on-going project, the risks of not accomplishing the goals is very limited. In the case of unexpected events influencing the good progress of this particular project, the trainee would then participate in a parallel European project.

The trainee is expected to have permanent contact with the host scientist, especially at the beginning of the traineeship, and periodical meetings (once per week) will be scheduled in order to follow the progress of the work and the needs of the trainee.

6. Evaluation plan (max 100 words):

- 1) Theoretical knowledge will be given by magistral lessons and supporting bibliographic material. A first evaluation will check if the basic concepts are fixed. Only once this goal is reached, we will proceed to the next step.
- 2) Experimental work: all the techniques and protocols will be explained in detail; then, the trainee will gradually increase his/her participation under supervision until he/she is able to work independently.
- 3) Discussion of results: the trainee will be asked to actively participate in the discussion of the results, this being a proper opportunity to identify additional actions needed to improve the formation.

7.a. Impacts and benefits of the traineeship to the host applicant (max 100 words):

Giving support, guiding and evaluating the trainee will be a valuable opportunity for the host scientist in order to increase managerial and leadership skills. This is of paramount importance for the career development of the host scientist. This program may also contribute to broad the network of collaborators of the host group. Since the trainee will be formed in order to work independently and in the frame of an on-going project, he/she will be an additional member of the research team during the duration of the traineeship.

7.b. Impacts and benefits of the traineeship to the trainee (max 100 words):

It is expected that the trainee will benefit from professional development by:

- acquiring knowledge and expertise in the field of study,
- expanding his/her knowledge on hands-on-work in a lab,
- gaining expertise in the interpretation and discussion of results,
- learning how to work independently, in an international team and in the frame of a project,
- improving the knowledge of languages.

From a personal point of view, an additional goal of the traineeship would be to take advantage of the unique and enriching experience of living abroad.

III. STUDENT PROFILE AND REQUIREMENTS

This section refers to specific knowledge or expertise that the student/trainee must have in order to proceed successfully with the proposed project.

<p>8. Research Area (see annex II): Chemistry/Chemical Engineering</p>		
<p>9. Is the host applicant / scientific supervisor willing to evaluate the project performance so that the student could validate the traineeship as ECTS credits (3):</p>	<p><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>	
<p>10. Student required expertise and technical knowledge:</p> <p>The student may have some experience in working in a chemical laboratory, and ideally in gas phase applications. Regarding the theoretical knowledge, formation in chemistry and/or chemical engineering is a must, and notions of fundamentals of adsorption in gas phase will be needed. Knowledge about porous carbon materials is a plus.</p>		
<p>11. Level of studies:</p> <p>The trainee should have a bachelor degree and preferably be enrolled in a Master's program.</p>		
<p>12. Language:</p> <p>English</p>		
<p>(4) The level of language competence in English (indicate here the main language of work that the trainee already has or agrees to acquire by the start of the mobility period is: A1 <input type="checkbox"/> A2 <input type="checkbox"/> B1 <input type="checkbox"/> B2 <input checked="" type="checkbox"/> C1 <input type="checkbox"/> C2 <input type="checkbox"/> Native speaker <input type="checkbox"/></p>		
<p>13. Does the host institution require any other language besides the language of work?</p>	<p><input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p>	<p>Which one?:</p>
<p>14. Does the host institution require any further paperwork done or any other relevant information to host a student/trainee (under the condition of this programme)</p>	<p><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>	<p>14. A</p> <p>If YES, please detail:</p> <p>Besides the Learning agreement, and given the military character of the Academy, it is possible that the trainee would eventually</p>

		<i>be asked to pass a security screening.</i>
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IV. Consent to publish Traineeship Data.

I agree that my name, title of the project, its duration and the name of the Receiving Institution / Enterprise can be published on the CEBE website as awarded supervisor of the Traineeship Programme 2020.

Brussels, 2nd February 2022

Leticia Fernandez Velasco
(Signature)

Digitally signed by Leticia Fernandez Velasco (Signature)
Date: 2022.02.02 11:10:03 +01'00'

- (1) a) Related to UAM: A minimum of 2 months and up to 4 months (only the first 3 are funded). The planned period in this call should be between 1st of June 2020 and 30th of December of 2021. After the matching of host candidates with students and by mutual agreement between the two parties, the exact dates can be changed and the total stay could be prolonged up to 6 months; b) Related to UCLM: A minimum of 2 months and up to 4 months (all 4 months are funded). The estimated start date of the internship is 1st July and can be extended up to a total of 12 months.
- (2) Consider that this must be read by the selection committee but also by the students, who will apply to the project.
- (3) If NO, only students who will not validate the project as ECTS credits will be assigned for matching with this applicant. The application to validate the project as ECTS credits will come exclusively from the student.
- (4) Level of language competence: a description of the European Language Levels (CEFR) is available at: <https://europass.cedefop.europa.eu/en/resources/european-language-levels-cefr>

Annex I: List of Organisation Types

CODE	Organisation type
EPLUS-EDU-HEI	Higher education institution (tertiary level)
EPLUS-EDU-GEN-PRE	School/Institute/Educational centre – General education (pre-primary level)
EPLUS-EDU-GEN-PRI	School/Institute/Educational centre – General education (primary level)
EPLUS-EDU-GEN-SEC	School/Institute/Educational centre – General education (secondary level)
EPLUS-EDU-VOC-SEC	School/Institute/Educational centre – Vocational Training (secondary level)
EPLUS-EDU-VOC-TER	School/Institute/Educational centre – Vocational Training (tertiary level)
EPLUS-EDU-ADULT	School/Institute/Educational centre – Adult education
EPLUS-BODY-PUB-NAT	National Public body
EPLUS-BODY-PUB-REG	Regional Public body
EPLUS-BODY-PUB-LOC	Local Public body
EPLUS-ENT-SME	Small and medium sized enterprise
EPLUS-ENT-LARGE	Large enterprise
EPLUS-NGO	Non-governmental organisation

EPLUS-FOUND	Foundation
EPLUS-SOCIAL	Social partner or other representative of working life
EPLUS-RES	Research Institute/Centre
EPLUS-YOUTH-COUNCIL	National Youth Council
EPLUS-ENGO	European NGO
EPLUS-NET-EU	EU-wide network
EPLUS-YOUTH-GROUP	Group of young people active in youth work
EPLUS-EURO-GROUP-COOP	European grouping of territorial cooperation
EPLUS-BODY-ACCRED	Accreditation, certification or qualification body
EPLUS-BODY-CONS	Counselling body
EPLUS-INTER	International organisation under public law
EPLUS-SPORT-PARTIAL	Organisation representing the sport sector
EPLUS-SPORT-FED	Sport federation
EPLUS-SPORT-LEAGUE	Sport league
EPLUS-SPORT-CLUB	Sport club

Annex II: Research Areas

Area of knowledge	University
Agricultural and agri-food engineering	Universidad Castilla La Mancha
Aerospace engineering	Universidad Castilla La mancha
Biochemistry	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Biology	Universidad Autónoma de Madrid
Biomedical engineering	Universidad Castilla La Mancha
Chemical Engineering	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Chemistry	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Computer Engineering	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Computer Engineering and Mathematics	Universidad Autónoma de Madrid
Electrical Engineering	Universidad Castilla La mancha
Environmental Sciences	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Food Science and Technology	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Forestry and environmental engineering	Universidad Castilla La mancha
Human nutrition and dietetics	Universidad Autónoma de Madrid
Industrial and automatic electronics engineering	Universidad Castilla La mancha
Mathematics	Universidad Autónoma de Madrid
Mechanical engineering	Universidad Castilla La mancha
Medicine	Universidad Castilla La mancha
Nursing	Universidad Castilla La mancha
Pharmacy	Universidad Castilla La mancha
Physics	Universidad Autónoma de Madrid
Physiotherapy	Universidad Castilla La mancha