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ESR-11 JOB VACANCY

Position description			
Reference:	**ESR-11**		
Title:	Multifunctional vitrimer building blocks for the synthesis of recyclable PU materials for a circular economy		
Hiring beneficiary:	**Covestro**		
Location:	Covestro Deutschland AG, Kaiser Wilhelm Allee, 51365 Leverkusen, Germany		
Start date:	01 October 2020	Duration:	36 months
Expected date of communication of results:	Less than 2 months after the application submission		

Job description	
Objective:	ESR11 will develop high-performance materials for the transformation from a linear to a circular economy. A library of different vitrimer-based polyols for the synthesis of polyurethanes will be developed and designed for reprocessing and recycling. The targeted materials aim at replacing the current technologies for adhesives and sealants used in e.g. construction and automotive applications in closed loop systems. A particular focus will be devoted to their recycling abilities and the maintenance of material properties after several recycling/reprocessing steps. ESR will characterize the structure, viscoelastic, thermomechanical and reversible material properties of the polyurethanes before and after several reprocessing steps.
Expected results:	Different vitrimer-based polyols relying on different dynamic chemistries (e.g. trans-N-alkylation, alkyl transfer or transamination) will be synthesized in small and large scale (>1 kg) and used as building blocks for the synthesis of polyurethanes having reprocessing, recycling and reversible adhesion capacities. Their structural and dynamic properties will be characterized by e.g. rheological measurements and will relate rearrangements of the network topology to macroscopic performances. The modulus, ultimate properties and fracture mechanics of fresh, aged and reprocessed materials will be investigated. Expected pioneering innovations are expected to contribute to improve product formulation and yield reversible adhesives and recyclable/reprocessable sealants with performances suited for e.g. construction and automotive applications. ESR11 will develop and upscale the synthesis of vitrimer polyols based on trans-N-alkylation exchanges during his secondment at UCBL (institution awarding PhD degree) and will replicate during his secondment at UGent the upscaled synthesis of other vitrimer polyols developed by ESR10. Both chemistries, performances and their suitability for a circular economy of resulting materials will be compared to the complementary products and applications of Covestro.

Supervisors:	Dr. D. J. Dijkstra Dr. V. Goldbach Pr. E. Drockenmuller, habilitated director for PhD degree award (the doctorate program will be performed in close collaboration with the graduate school of the University Claude Bernard Lyon 1, France).
Secondments (short term academic and industrial internships):	S1 to **UCBL** (Lyon, France) – 7 months – develop upscalable ionic polyols with vitrimer properties for the synthesis of recyclable PU elastomers. S2 to **UGent** (Ghent, Belgium) – 3 months – replicate the upscaled synthesis of vitrimer polyols developed by ESR10 for the synthesis of PU elastomers.

Vacancy requirements	
Qualifications:	Not having resided in Germany for more than **12 months in the 3 years** immediately before the recruitment date, and **not having carried out their main activity** (work, studies, etc.) in Germany during this period. Having a master degree or equivalent diploma, less than 4 years of research career at the recruitment date, and not having a doctoral degree. Solid background in polymer chemistry (synthesis and processing).
Languages:	Good level in oral and written English is mandatory. German language is optional. German courses can be offered through a local adult education centre. French courses can be offered through the UCBL doctorate school.
Skills:	Ability for project management, dissemination, communication with colleagues and supervisors and strong teamwork spirit.
Experience:	Having completed a research internship in academia or industry.

Job details	
Gross salary:	Salary and benefits will be in compliance with the rules of the ITN-MSCA, as foreseen in the Marie Skłodowska-Curie Actions Work Programme. Total remuneration costs (including salaries, social security contributions, taxes and other costs included in the remuneration) per month: 3171,90 € Gross salary: 2645 € per month + 415 € mobility allowance (estimated net salary before income tax: 2140 €/ month + 336 € mobility allowance)
Other benefits:	Gross family allowance: 350 € per month - if applicable at the time of recruitment (estimated net family allowance before income tax: 280 €/month) Family allowance: 'Family' means persons linked to the researcher by marriage (or a relationship with equivalent status to a marriage recognised by the legislation of the country where this relationship was formalised) or dependent children who are actually being maintained by the researcher. ESR 11 will further benefit from working in industrial research and will be able to get deeper insights into Covestro as a company and sustainability leader. Besides the individual scientific project the ESR fellow can build an international industrial network and participate in the company's education and cultural programs.

Duration:	36 months
Starting date:	Ideally ca. the 01/10/2020
Type of contract:	Full time position
Hours per week	37.5 hours
Place of work:	Covestro Germany AG, Kaiser Wilhelm Allee, 51365 Leverkusen, Germany, www.covestro.com
Local language:	German

Application package is available on the Recruitment page of the VITRIMAT website https://www.vitrimat.eu/Recruitment.html