Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*

1. Članica UL (*UL member)*:

Univerza v Ljubljani, Naravoslovnotehniška fakulteta

2. Ime, priimek in elektronski naslov mentorja/ice (*Mentor's name, surname and email*):

Boštjan Markoli, bostjan.markoli@ntf.uni-lj.si

3. Raziskovalno področje (*Research field*):

2.10 Proizvodne tehnologije in sistemi, 2.10.02 Izdelovalne tehnologije

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo:
Usposabljanje mladega raziskovalca bo vezano na raziskave in razvoj nove izdelovalno-predelovalne tehnologije za elektronki odpad, s ciljem pridobivati predvsem izhodno kemijsko čiste kovine in zlitine. Pri tem bodo raziskave osredotočene na preučevanje klasičnih pirometalurških in hidrometalurških procesov za recikliranje elektronskega odpada in pa preiskovanje in razvoj postopkov recikliranja, ki so podprti z uporabo biološko aktivnih organizmov. Nadalje bodo preiskovani drugi sorodni postopki in pa opredelitev pomembnih parametrov pri sledenju procesom ob uporabi biološko aktivnih organizmov. V začetnem delu bo prioriteta tudi opredelitev in izbira postopka, ki je najbolj učinkovit, tako s strokovnega kot ekonomskega stališča.

Potencialni kandidat/ka mora poznati vpliv osnovnih fizikalno-metalurških parametrov pridobivanja čistih kovin in izdelave večkomponentnih zlitin (predvsem tistih, ki se najpogosteje uporabljajo v mikroelektroniki) ter poznavanje hidro- in pirometalurških postopkov in njihovih značilnosti. Nadalje je nujno poznavanje povezave med postopki pridobivanja čistih kovin in izdelovalnimi postopki za zlitine ter značilnostmi teh materialov, kot integralnim delom mikroelektronskih naprav in sistemov.

Kandidat/ka mora izkazovati inovativnost, sposobnost za timsko delo, komunikativnost, splošna znanja o uporabi računalniških orodij, smisel za organizacijo lastnega dela in dela raziskovalne skupine, znanje slovenskega in angleškega jezika. Poleg tega so nujna tudi naslednja specifična znanja. Znanje in izkušnje na področju sinteze in recikliranja kovinskih materialov. Obvladovanje priprave vzorcev (predvsem kovinskih materialov) za svetlobno mikroskopijo, SEM (vrstično elektronsko mikroskopijo) ter rentgensko difrakcijo in obvladovanje priprave vzorcev za presevno elektronsko mikroskopijo. Usposobljenost za delo s programskim orodjem ThermoCalc, SEM (vrstični elektronski mikroskop) ter metodami EDS in EBSD ter usposobljenost za delo s TEM (presevni elektronski mikroskop). Potrebna je tudi usposobljenost za interpretacijo eksperimentalnih rezultatov na osnovi svetlobne mikroskopije, SEM, EDS, EBSD, TEM in rentgenske difrakcije.

eng:
The young researcher's training will be linked to the research and development of new manufacturing and processing technologies for electronic waste, with the aim of obtaining mainly chemically pure metals and alloys. The research will focus on the investigation of classical pyrometallurgical and hydrometallurgical processes for the recycling of electronic waste as well as on the investigation and development of recycling processes supported by the use of biologically active organisms. In addition, other related processes will be investigated as well as the definition of important parameters in the pursuit of processes with biologically active organisms. The initial phase will also focus on defining and selecting the most effective process from a technical and economic point of view.

The potential candidate must know the effects of the basic physical-metallurgical parameters of the extraction of pure metals and the production of multi-component alloys (especially those most commonly used in microelectronics), as well as knowledge of hydro- and pyrometallurgical processes and their characteristics. In addition, it is necessary to know the relationship between the processes for the extraction of pure metals and the processes for the production of alloys and the properties of these materials as an integral part of microelectronic devices and systems.

The candidate must demonstrate innovation, the ability to work in a team, communicative skills, general knowledge of the use of computer tools, a sense of organization of one's own work and the work of a research group,

knowledge of the Slovenian and English languages. In addition, the following specific skills are also necessary. Knowledge and experience in the field of synthesis and recycling of metallic materials. Mastering the preparation of samples (mainly metal materials) for light microscopy, SEM (line electron microscopy) and X-ray diffraction and mastering the preparation of samples for scanning electron microscopy. Competence to work with ThermoCalc software, SEM (line electron microscope) and EDS and EBSD methods, as well as competence to work with TEM (scanning electron microscope). Competence in interpreting experimental results based on light microscopy, SEM, EDS, EBSD, TEM and X-ray diffraction is also required.

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2. Ime, priimek in elektronski naslov mentorja/ice (*Mentor's name, surname and email*):

Milan Terčelj, milan.tercelj@ntf.uni-lj.si

3. Raziskovalno področje (*Research field*):

Uporabna geofizka, Merstvo, Materiali in Umetna inteligenca

4. Opis delovnega mesta mladega raziskovalca/ke (D*escription of the Young Researcher's position)*:
Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo: Delo MR bo obsegalo izvajanje meritev, shranjevanje merjenih podatkov, organizacijo podatkov v podatkovne vire in njihovo analizo s pomočjo mehke logike. Zaželeno je, da ima kandidat znanja s področji Uporabe geofizike, Merstva, Materialov in Umetne inteligence. Poleg znanj s področij raziskav je zaželeno, da kandidat dobro pozna področje Geotehnologije. Od kandidata pričakujemo računalniško pismenost, poznavanje GIS in CAD orodij.

eng: JR's work will consist of performing measurements, storing measured data, organizing data into data sources and analyzing them with the help of soft logic. It is desirable that the candidate has knowledge in the fields of Applied Geophysics, Measurement, Materials and Artificial Intelligence. In addition to knowledge in the fields of research, it is desirable that the candidate has a good knowledge of the field of Geotechnology. We expect computer skills, knowledge of GIS and CAD tools from the candidate.