

# Prospective supervisor's form

Name of the supervisor: Magdalena Śliwka-Kaszyńska

Academic title: PhD DSc

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Discipline: chemical sciences [NCh] none

Optional

Key words (obligatory four key words describing research interests / expertise):

# natural organic dyes

# degradation

# liquid chromatography

# mass spectrometry

## Bibliometric indicators

1. Number of journal publications in WoS/ Scopus 30/25

2. Citations excluding self-citations WoS 481 Scopus 516

3. Hirsch index WoS 13 Scopus 14

1. The number of PhD students who have graduated under your supervision: 1

2. The number of PhD students currently supervised:

a. within the current doctoral school 0

b. within doctoral studies (previous system) 0

3. Are you currently accepting new PhD students:

a. Polish Yes/No Yes

b. Foreign Yes/No Yes

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### Research interests or topics offered for PhD research (no more than 2000 characters)<sup>ii</sup>

In the study of objects of cultural heritage such as textiles and paints, the identification of the materials plays an important role. This is a huge challenge for scientists and requires application of advanced analytical techniques. The identification of colouring substances present in historical objects provides relevant information for a wide range of specialists dealing with works of art. Knowledge about natural dyes in historical objects is helpful for the development of effective and appropriate conservation strategies, to determine the origin of an artefact, as well as to obtain historical information necessary for the purposes of documenting an artwork and determining a work's authenticity. The isolation and identification of dyestuffs from paints used by artists is complicated and time-consuming. The natural organic dyes extracted from plants, insects or shellfish, due to their origin, often exist in glycosidic form. In order to properly identify colouring substances, it is necessary to isolate them from the matrix without changing the primary structure of the colouring substances. For this reason, the use of a mild and also effective extraction method plays a key role. The aim of the research work is to develop a universal method of isolating and identifying the dyestuffs' different matrixes using liquid chromatography coupled with mass spectrometry.

Over the course of the PhD research, basic tasks will be performed:

- development of method for the isolation of colouring substances from paint, textiles and dye raw materials
- development of a universal method of identification of colouring substances using LC-MS
- performing a spectrochromatographic analysis of dyestuffs present in extracts of dye raw materials
- identification of dyestuffs and its photo and biodegradation products present in the historical paints and textiles
- identification of mordants and types of historical threads using SEM-EDS and FTIR techniques.

### Funding or special equipment needed to carry out a PhD project <sup>iii</sup>:

1. Is funding available for experimental work: *Yes/No/not needed*

No

2. Is the equipment needed to complete a PhD project

available in your lab/department: *Yes/No/not needed*

Yes

### Most important publications no more than 5 published after 1.01.2018

No	Authors/title/journal	Number of points according to the current list of the Ministry of Science and Higher Education	Publication year
1.	O. Otlowska; M. Slebioda; A. Kot-Wasik; M. Sliwka-Kaszynska; et al. "Chromatographic and Spectroscopic Identification and Recognition of Natural Dyes, Uncommon Dyestuff Components, and Mordants: Case Study of a 16th Century Carpet with Chintamani Motifs" MOLECULES, 23, 339.	100	2018
2.	Śliwka-Kaszyńska, M., Jakimska-Nagórska, A., Wasik, A., Kot-Wasik, A. "Phototransformation of three selected pharmaceuticals, naproxen, 17 $\alpha$ -Ethinylestradiol and tetracycline in water: Identification of photoproducts and transformation pathways" Microchemical Journal 148, 673	70	2019

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3.			
4.			
5.			

**Most recent externally funded projects you were involved in – no more than 3**

No	Project title, the name of the Principal Investigator (PI) and the institution the project was carried out	Years	Role in the project <sup>iv</sup>
1.	Identification of organic coloring substances present in 18th Polish flags; National Museum in Krakow. No. nr 033331	2018	PI
2.			PI
3.			PI

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### Additional relevant information (no more than 1600 characters)<sup>v</sup>

Over the course of the PhD research, basic tasks will be performed:

- development of method for the isolation of colouring substances from paint, textiles and dye raw materials;
- development of a universal method of identification of colouring substances using LC-MS techniques;
- performing a spectrochromatographic analysis of dyestuffs present in extracts of dye raw materials;
- identification of dyestuffs and its photo and biodegradation products present in the historical paints and textiles ;
- identification of mordants and types of historical threads using SEM-EDS and FTIR techniques.

<sup>i</sup> You may select up to two disciplines out of 12 disciplines represented in the Doctoral School

<sup>ii</sup> Observe the limit of not more than 2000 characters

<sup>iii</sup> Leave only one answer

<sup>iv</sup> Select the role in the project: PI stands for principal investigator (refers to the holder of an independent grant and the lead researcher for the grant project), Co-I for co-investigator (Co-I assists the principal investigator in the management and leadership of the research project), R for researcher

<sup>v</sup> Add any other relevant information e.g. awards for PhD students whom you supervised (no more than 1600 characters)