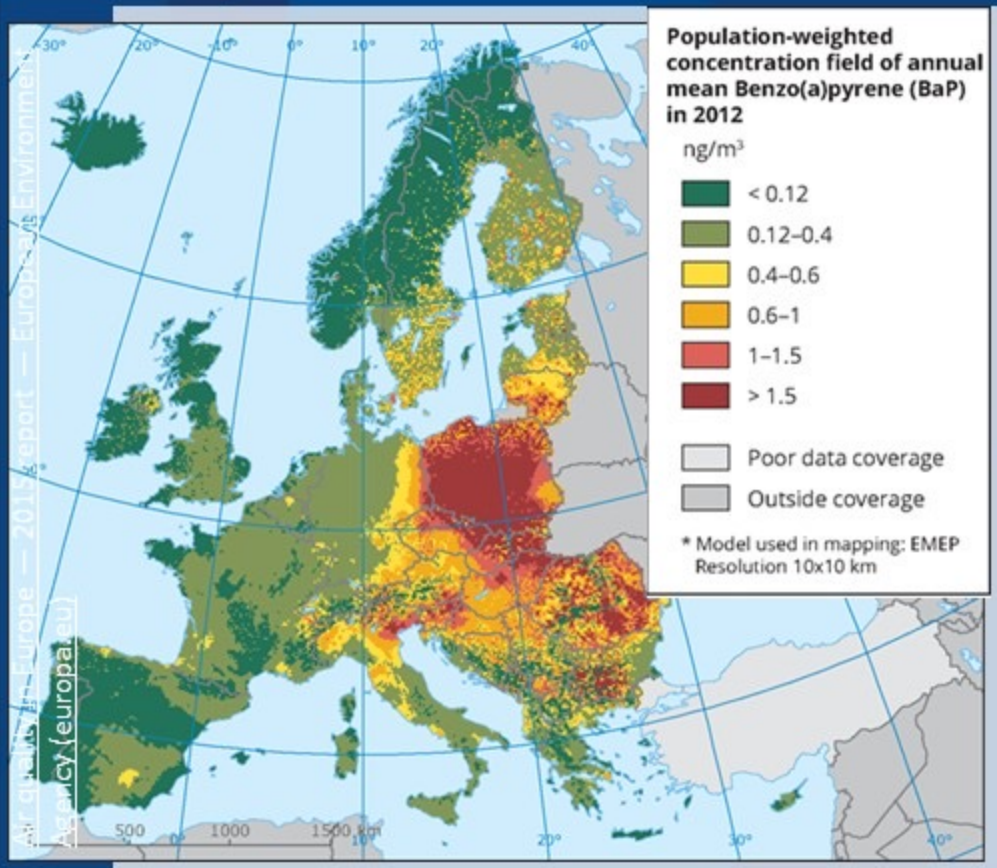
UNIVERSITY OF SILESIA
IN KATOWICE

Microscopic constituents in solid residues from household combustion

[1] Zbigniew Jelonek, [1]Iwona Jelonek, [1] Magdalena Misz-Kennan
[1]*University of Silesia in Katowice*

71st Annual ICCP Meeting, Hague, the Netherlands, 15-21/09/2019

Introduction: The quality of the air

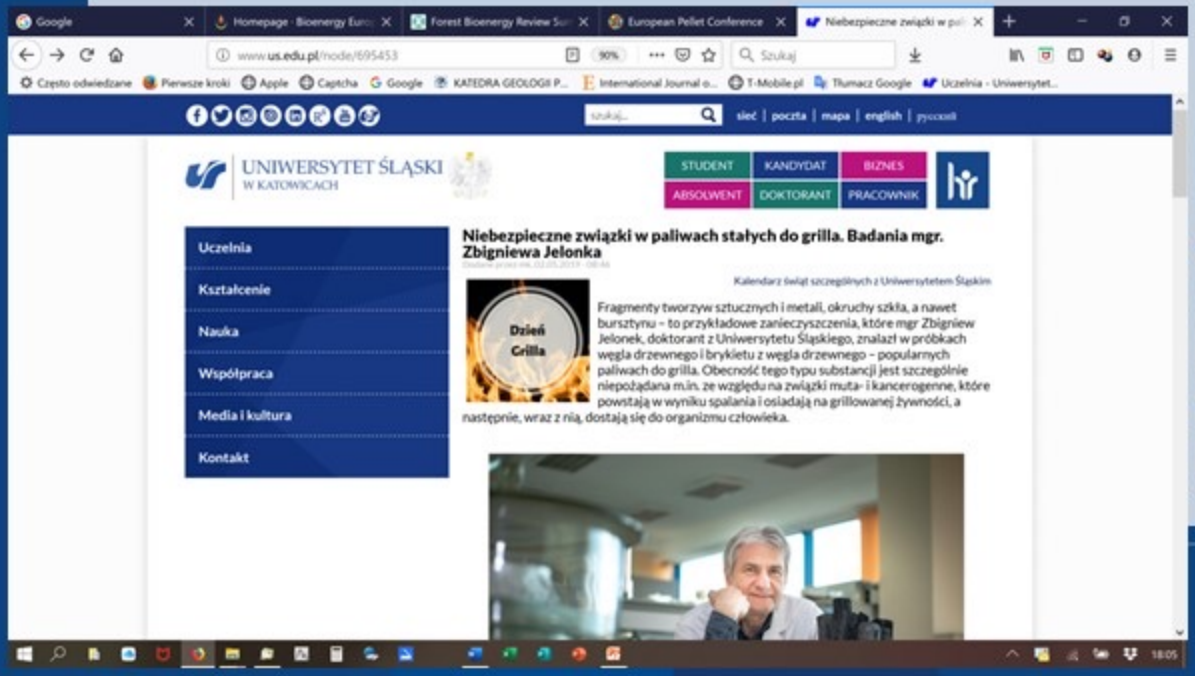


- According to the report of the World Health Organization, "Ambient Air Pollution Database 2016", 33 out of the **50 most polluted cities** in the European Union are located in Poland.
- While the report of the World Health Organization in 2015 shows that air pollution in Poland contributed to **the deaths of 48 544** Poles in the year 2010, which in turn generated costs in the amount of 101, 826 billion dollars.

UNIVERSITY OF SILESIA
IN KATOWICE

Introduction: The motivation for the studies…

One concern entrepreneur and one amazing scientist, who decided to start their cooperation using a special Ph.D. studies program found by Polish Ministry of Science and Higher Education which leads not only to doctoral degree obtainment but also to the implementation of a new product for the domestic market.



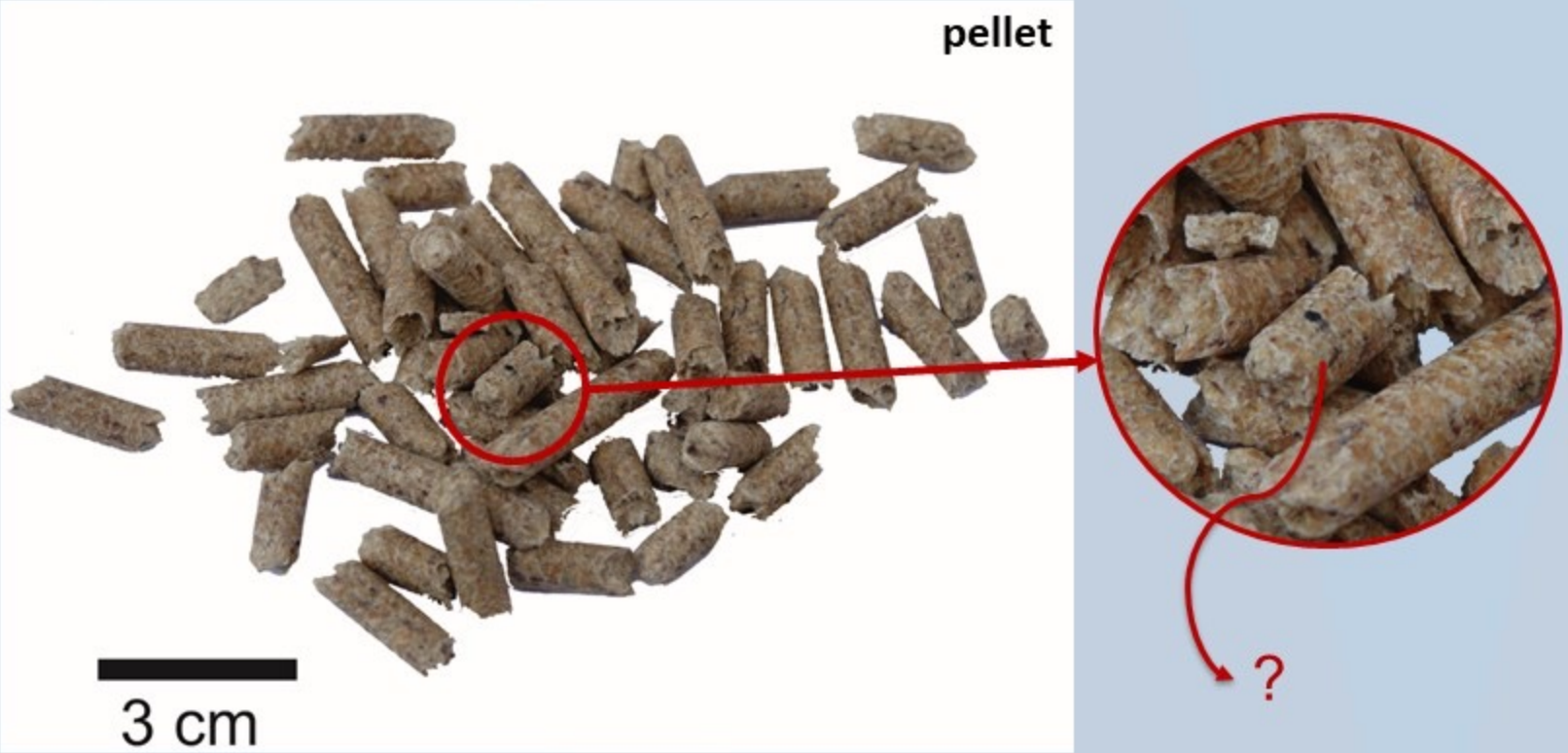
Prof. dr hab. Monika Fabiańska

www.us.edu.pl

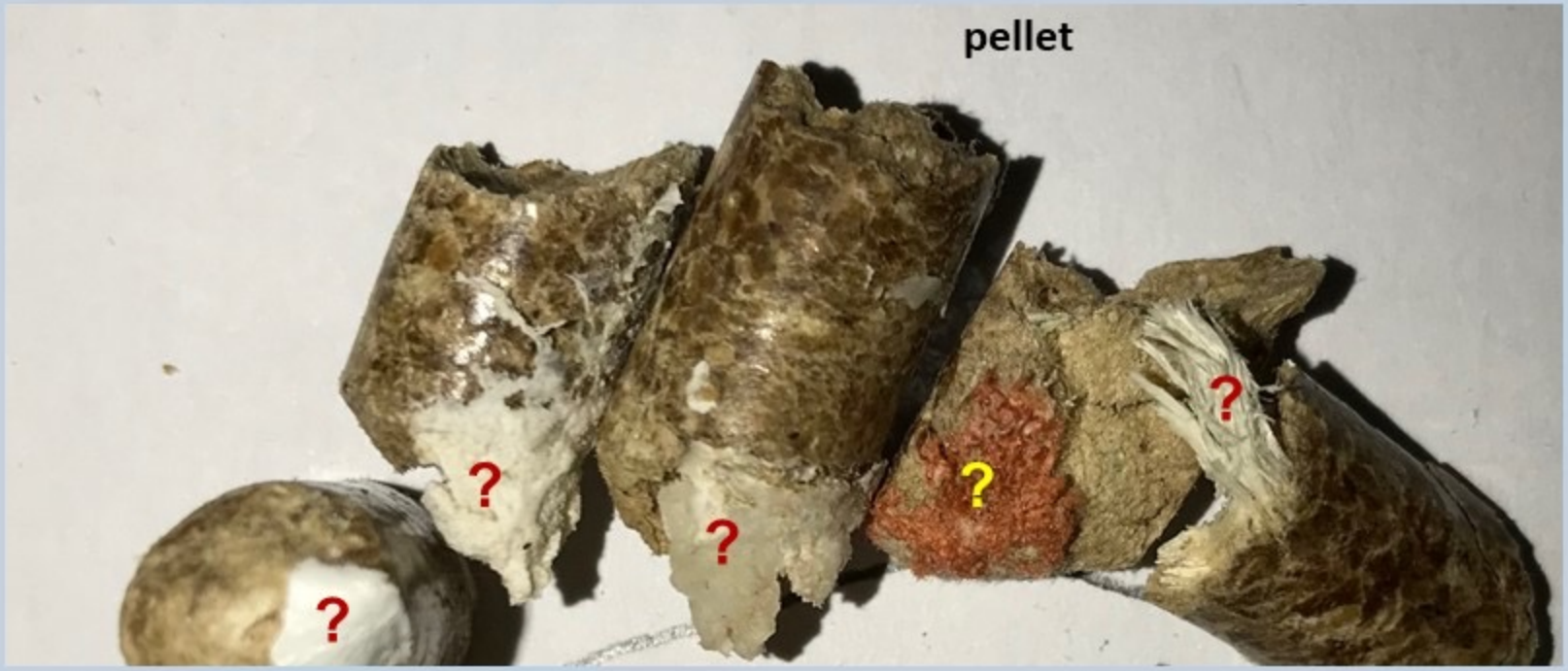
Introduction: The motivation for the studies…

Determining optically recognizable characteristic residues in ashes from unwanted additives burned with dedicated fuels will complete and simplify these analyzes. This will also allow the identification of components that were previously impossible or very difficult to detect.

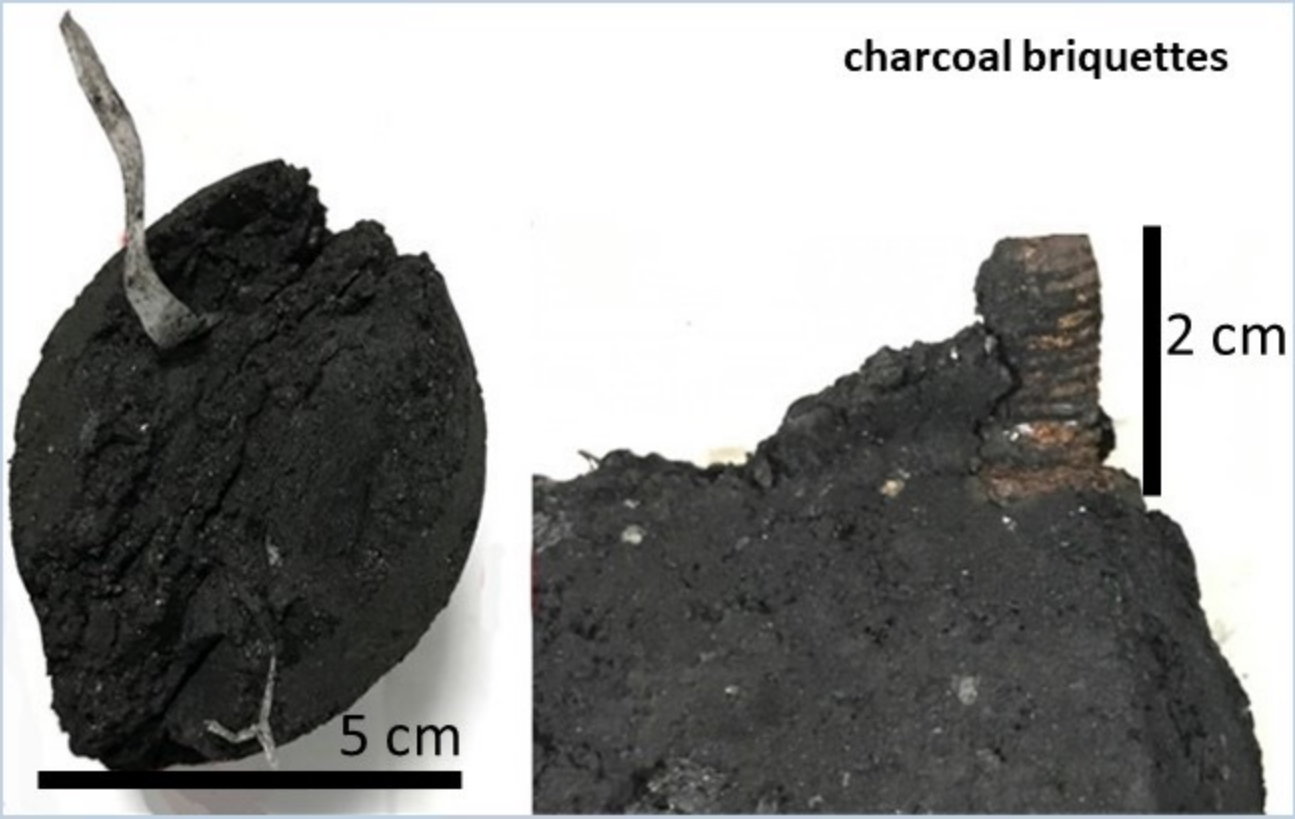
Introduction: The motivation for the studies…



Introduction: The motivation for the studies…

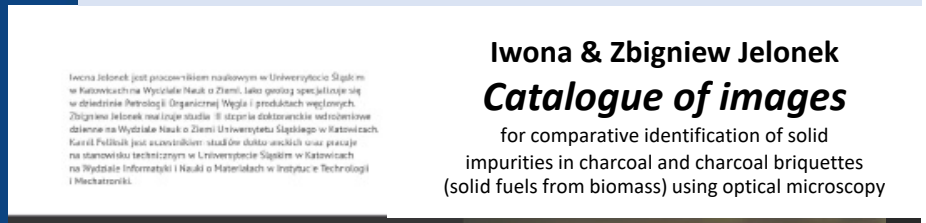


Introduction: The motivation for the studies…



UNIVERSITY OF SILESIA
IN KATOWICE

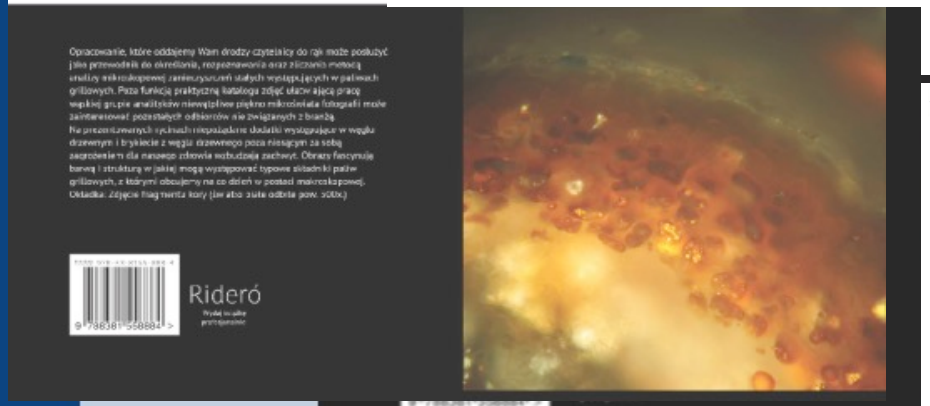
Introduction: The motivation for the studies…



Iwona & Zbigniew Jelonek

Catalogue of images

for comparative identification of solid impurities in charcoal and charcoal briquettes (solid fuels from biomass) using optical microscopy



ISBN 978-83-8155-888-4

INDIANA GEOLOGICAL & WATER SURVEY
ISSN 2642-1550, Volume 3, 2021
INDIANA JOURNAL OF EARTH SCIENCES

ATLAS OF CHARCOAL-BASED GRILLING FUEL COMPONENTS

Agnieszka Drobniak[1], Zbigniew Jelonek[2], Maria Mastalerz[1], Iwona Jelonek[2]

[1] *Indiana Geological and Water Survey, Indiana University, 1001 E. 10th St., Bloomington, IN, 47405, USA*
[2] *University of Silesia in Katowice, Institute of Earth Sciences, ul. Będzińska 60, 41-200 Sosnowiec, Poland*

E-mail: agdrobni@indiana.edu
Received 05/12/2021
Accepted for publication 07/12/2021
Published 07/13/2021
Suggested citation: Drobniak, A., Jelonek, Z., Mastalerz, M., Jelonek, I., 2021, Atlas of Charcoal-Based Grilling Fuel Components: Indiana Geological and Water Survey, Indiana Journal of Earth Sciences, v. 3. DOI 10.14434/ijes.v3i1.32559.

Editor's Note: This manuscript links to an online atlas stored on Resource Space at the IGWS:

Click here to visit the atlas

https://data.igws.indiana.edu/pages/search.php?k=ce4dccd7d5&search=%21collection175

INDIANA GEOLOGICAL & WATER SURVEY
ISSN 2642-1550, Volume 3, 2021
INDIANA JOURNAL OF EARTH SCIENCES

ATLAS OF WOOD PELLET COMPONENTS

Agnieszka Drobniak[1], Zbigniew Jelonek[2], Maria Mastalerz[1], Iwona Jelonek[2]

[1] *Indiana Geological and Water Survey, Indiana University, 1001 E. 10th St., Bloomington, IN, 47405, USA*
[2] *University of Silesia in Katowice, Institute of Earth Sciences, ul. Będzińska 60, 41-200 Sosnowiec, Poland*

E-mail: agdrobni@indiana.edu
Received 02/03/2021
Accepted for publication 03/29/2021
Published 04/19/2021
Suggested citation: Drobniak, A., Jelonek, Z., Mastalerz, M., Jelonek, I., 2021, Atlas of Wood Pellet Components: Indiana Geological and Water Survey, Indiana Journal of Earth Sciences, v. 3. DOI 10.14434/ijes.v3i1.31905.

Editor's Note: This manuscript links to an online atlas of wood-pellet photomicrographs stored on Resource Space at the IGWS:

http://go.iu.edu/woodpelletatlas

https://data.igws.indiana.edu/pages/search.php?k=ce4dccd7d5&search=%21collection144

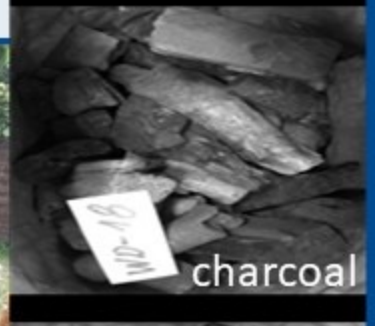
Objectives of the exercise for ashes obtained from household furnaces. Working Group:

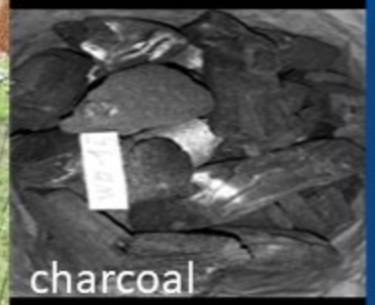
The purpose of the exercise is to optically identify the quality and quantity of components found in ashes obtained from household furnaces.
Optical examination of ashes obtained from boilers and furnaces combined with their physical and chemical analysis will allow determining the quality of fuels used in domestic furnaces after their combustion. This will also allow identifying and eliminating contaminated fuels produced from biomass and used in household furnaces.

Selection of the sample and preparation:

UNIVERSITY OF SILESIA
IN KATOWICE

Selection of the sample and preparation:





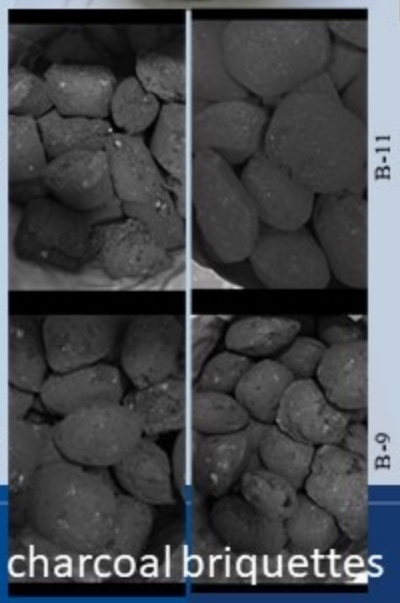
www.us.edu.pl

UNIVERSITY OF SILESIA
IN KATOWICE

Selection of the sample and preparation:

Selection of the sample and preparation:

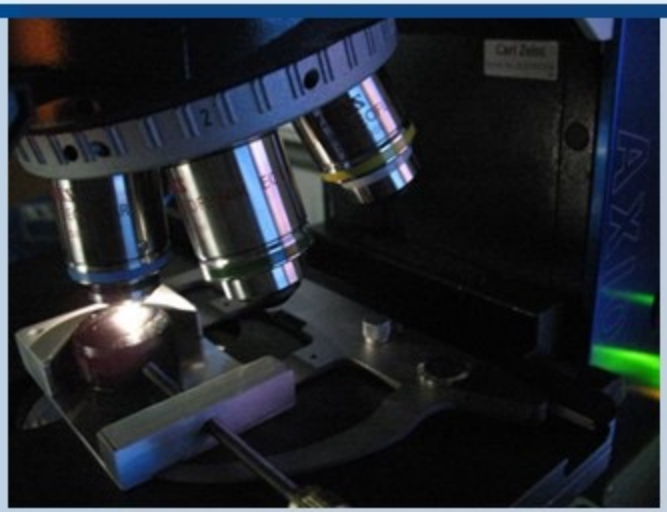
charcoal

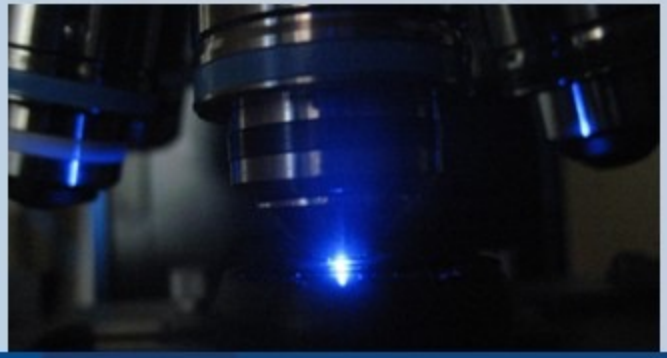


charcoal briquettes

pellets

Instructions – how to perform the exercise:





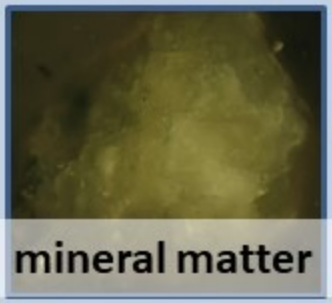

INTERNATIONAL STANDARD ISO 7404-3

Methods for the petrographic analysis of coals —
Part 3:
Method of determining maceral group composition

Instructions – how to perform the exercise:

There are following particles:

rust, metal, plastic, slag, glass, petroleum products, mineral matter, coal, biomass, bark, coke, and others



In summary – how to perform the exercise:

- ✓ Three sets were prepared for the exercise. Each participant of the exercise will receive:
  - photos made of ashes obtained from pellet combustion
  - photos made of ashes obtained from charcoal combustion
  - photos made of ashes obtained from charcoal briquettes combustion
  - "Catalog of photos for comparative identification of solid impurities found in charcoal and charcoal briquettes by optical microscopy„

The exercise consists of:

1. Identification of individual elements indicated by an arrow in individual photos (1-20) for each set separately.

2. Entering the results (example *) in the appropriate columns (reply.xlsx file) for each sheet set for Excel 1. (Pellet), Excel 2. (Charcoal), Excel 3. (Briquette)

- ✓ All participant are also welcome to add their comments to this exercise.
- ✓ The total time needed for performing the exercise is of about 2 hours, so we hope to receive your response before **10 September 2021 (deadline).**

UNIVERSITY OF SILESIA
IN KATOWICE

Thank you for your attention

Any further questions? Please direct them to:

Dr Zbigniew Jelonek
e-mail: zjelonek@us.edu.pl

Dr hab. Iwona Jelonek, MBA
e-mail: iwona.jelonek@us.edu.pl

Dr hab. Magdalena Misz-Kennan
e-mail: magdalena.misz@us.edu.pl