

Database of Artistic Materials of National Gallery Prague (DatUM NGP)



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Introduction

One of the most important points in the complex process of collection items care is to understand its material composition and identify its components. For this purpose – apart from the availability of suitable analytical methods – it is necessary to have high-quality reference sources and comparative data files, which are also easily accessible to the general professional public (especially thanks to their online format). To this date, several online material databases dealing with art materials (pigments, dyes, binders, etc) and their instrumental analysis already exist. However, despite all benefits, these databases also may have several limits arising from their specific focus.

Research Aims

In this work, we are introducing the current project of the National Gallery Prague (NGP): a completely new online database of around 250 standards of pigments and dyes used through the whole history of art.

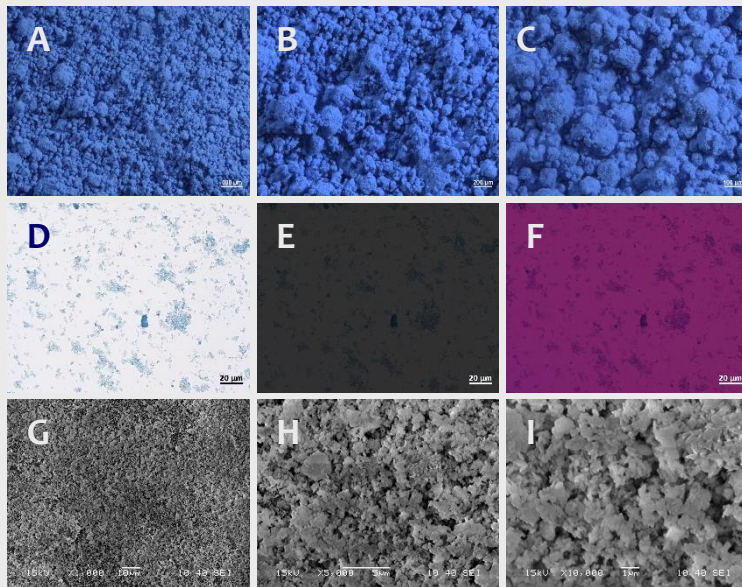
STRUCTURE OF DATABASE

1. Basic Information

- preview
- nomenclature (Czech, English, alternative names, trade names)
- colour, manufacturer and manufacturing number, CAS and C.I. identifiers, chemical composition

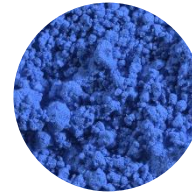
2. Photographs (morphology)

- photomicrographs of powder material
- polarizing optical microscopy (PPL, XPL, XPL+λ)
- scanning electron microscopy (SE)



Examples of presented particle morphology of cobalt blue medium standard: powder pigment at 25x (A), 50x (B) and 100x (C) magnification; polarizing optical microscope images in plane-polarized light (D), cross-polarized light (E) and cross polarized light with a sensitive tint plate (F); scanning electron microscope images in secondary electron mode at 1000x (G), 5000x (H) and 10 000x (I) magnification

Pigment



CoAl₂O₄

Title

Cobalt blue, medium

Manufacturer

Kremer Pigmente

CAS

1345-16-0

Manufacturing number

45710

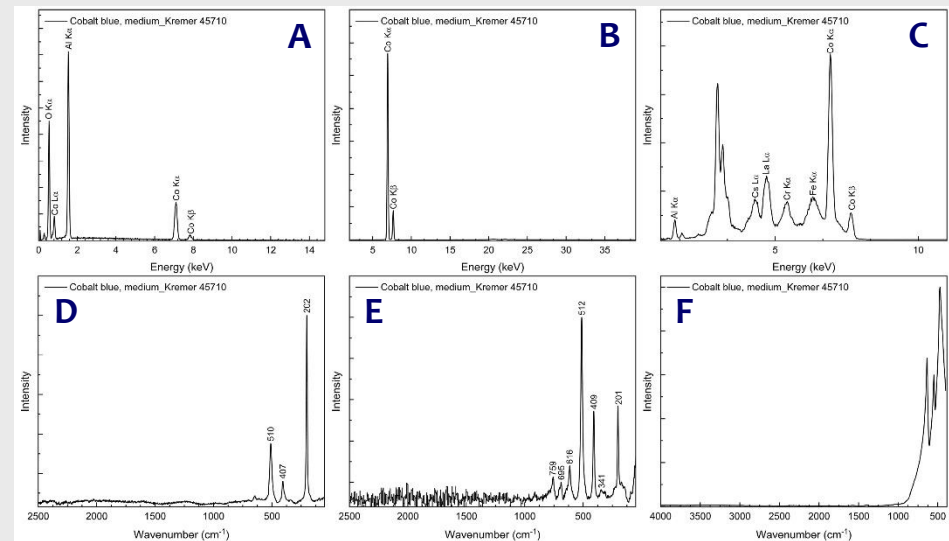
C.I.

PB 28.77346

Examples of basic information of cobalt blue medium standard output

3. Spectra

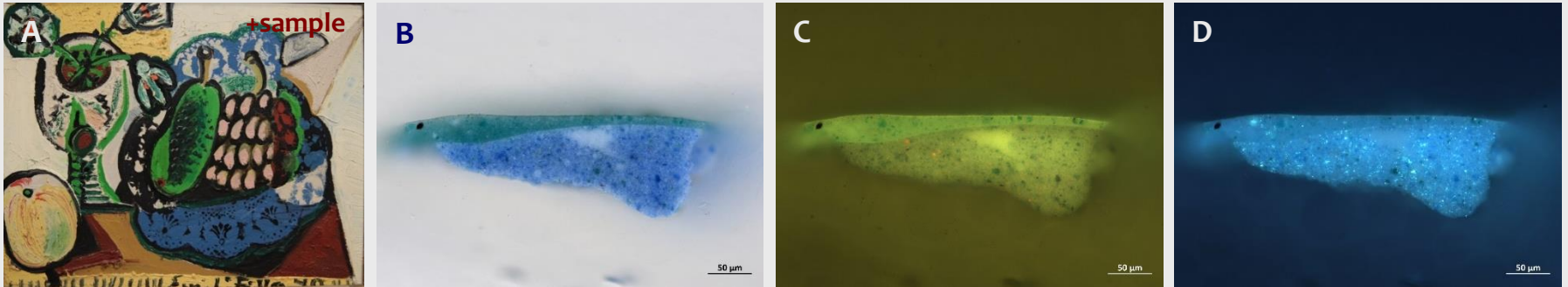
- EDS and XRF (main range, light range) elemental spectra
- Raman (532 nm, 780nm) and ATR infrared molecular spectra



Examples of presented spectra of cobalt blue medium standard: energy-dispersive (A) and X-ray main range (B) and light range (C) elemental spectrum; Raman 532 nm (D) and 780 nm (E) and ATR infrared (F) molecular spectrum

4. Use on artworks

- examples of use in real colour layers of paintings and polychromy of sculptures from NGP collections



Example of use of cobalt blue medium pigment : Emil Filla, Still life with fruit and flowers, 1949, NGP, inv. no. O 11503 (A) and stratigraphy images of the taken sample in reflected light (B) and after excitation by green light at 475 nm with emission filter > 515 nm (C) and UV light at 385 nm with emission filter > 420 nm (D)

Conclusion

- reference database unique in number and variability of included materials as well as scope of presented analytical information
- combine **nomenclature** and **basic information** about each item with its **analytical information** from instrumental methods as well as **examples of use on artworks** from NGP collections in one place
- deals with **about 250 color layer components** from all ages: pigments (natural, synthetic), dyes and their raw materias, fillers, minerals, binders etc.
 - standards from NGP collections with defined chemical composition (mainly supplied by Kremer Pigmente GmbH)
 - variability of materials (i.e. natural and synthethic version, natural pigments from different localities, synthethic pigments form several suppliers etc.)

online from 2023 on NGP website: <https://www.ngprague.cz/>

Acknowledgement

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