

THE MICROMINERALOGICAL COLLECTION OF THE MINING AND GEOLOGICAL SURVEY OF HUNGARY – AN INTRODUCTION

PÉTERDI, B.¹, SZILÁGYI, V.², SZAKMÁNY, Gy.³, JÓZSA, S.³, MIKLÓS, D. G.³ & GYURICZA, Gy.¹

¹ Mining and Geological Survey of Hungary, Budapest, Hungary

² Centre for Energy Research, Budapest, Hungary

³ Department of Petrology and Geochemistry, Eötvös Loránd University, Budapest, Hungary

E-mail: peterdi.balint@mbfsz.gov.hu

History of the Micromineralogical Collection

The micromineralogical collection of the Mining and Geological Survey of Hungary (MBFSZ) has been established between 1986–1990, in the frame of the project “The study of the recent and fossil river bars of Hungary”. This project was stopped abruptly in 1992. The sampling of recent river sediments and Miocene to Holocene age sediments of sand or gravel mines was completed and the shallow drilling program of the alluvial cones of the Danube and Maros rivers was in an advanced state at that time (1992). However, the sampling of sediments from deep drillings was not realized. Sample preparation and most of the planned investigations were finished but due to the sudden stop of the project the results were not gathered and most of them – sedimentological results, spectroscopic results of the grain fraction smaller than 0.063 mm and most of the field reports – were lost.

The samples of the proposed micromineralogical collection “prepared for investigation” remained together and were deposited in the MBFSZ. The results of the composition analyses of almost half of the samples were saved as well. These analyses were based on area estimation of the heavy minerals in the whole mass of the magnetic fractions (“without a sampling of the sample”). In the cases of some selected samples, the analyses were based on polarising microscopy and EPMA. But the documentation of the sampling points was missing – only one representative of the map (1:500.000) showing the sampling points survived. So the collection has become invaluable.

In 2016 the field reports – with the descriptions of all the sampling points and samples, and the field drawings of most of the sampling places – were recovered by a lucky coincidence. Due to these information – and with the remarkable financial and labour expenditure of the Survey – the sample collection was rescued, and it regained its scientific value. Now the samples are professionally stored and inventoried to prevent further deterioration and ensure rapid retrieval.

The content of the Micromineralogical Collection

The micromineralogical collection of the MBFSZ contains the samples of the surficial/near-surface alluvial clastic sediments of the whole territory of the country from 863 sampling points (4326 individually inventoried samples). The samples originate from 754

sites: 510 mines (sand or gravel mines, Miocene to Holocene age sediments), 145 recent river bars and 99 samples from shallow drillings on the Pleistocene age alluvial cones of the Danube and Maros rivers.

From each sampling point, 10–100 kg sediments were collected (according to the average grain size of the sediment), except for the drillings. Due to a sieving – magnetic separation – heavy-media separation method, each sample was separated into 5 or 6 fractions. Ferromagnetic fraction (fr. A): practically magnetite. Three paramagnetic sequences: fr. B: ilmenite, hypersthene, etc.; fr. C: garnets, other pyroxenes, magmatic amphiboles, etc.; fr. D: metamorphic amphiboles, epidote-group minerals, staurolite, etc. Diamagnetic fraction (fr. E): zircon, kyanite, gold, etc. without the residual light minerals. In the cases of the earlier prepared samples the residual light minerals were retained as fr. E and the diamagnetic heavy minerals were named as fr. F.

The inventory records contain data about the sampling site and the sampling point within the site (e.g. sampled layer), grain category (e.g. sandy silt) of the original sample and the original mass of the separated fractions (A-E/F, see above).

Utilization proposals of the Collection

The original project (establishing the collection) aimed at the understanding of the sedimentation history of the filling-up Pannonian Basin. However, the Collection as comparative material is well applicable for several other purposes e.g., ablation area studies; genetic studies of sandstones; archaeometric studies (provenance investigations of sandstone artefacts or ceramics etc., e.g., SZILÁGYI *et al.*, 2021, in this volume); explorations for precious metals and rare elements; geochemical mapping projects (JÓZSA *et al.*, 2020).

References

- JÓZSA, S., SZAKMÁNY, Gy., MIKLÓS, D. G. & VARGA, A. (2020): *Földtani Közlöny*, 150: 291–314.
- SZILÁGYI, V., PÉTERDI, B., SZAKMÁNY, Gy., JÓZSA, S., MIKLÓS, D. G. & GYURICZA, Gy. (2021): *Acta Mineralogica-Petrographica, Abstract Series*, 11, 44