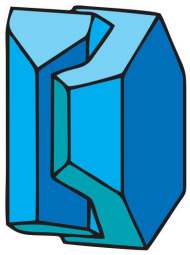
emc²

18–23 August 2024

4th european mineralogical conference • Dublin, Ireland

PROGRAMME AND ABSTRACTS



Mineralogical Society of the UK and Ireland

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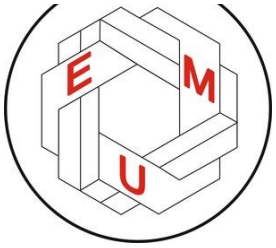

Mineralogical Society
of the UK and Ireland

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WELCOME

We are delighted to welcome all delegates, in-person and remote, to Dublin for this the fourth edition of the European Mineralogical Conference (EMC 2024). We hope that we can live up to the high standards set in Frankfurt, Rimini and Cracow.

Thanks to your enthusiasm and willingness to participate, we have a jam-packed programme for you to enjoy. We have sessions numbering up to 38, we have four plenary lectures and a public lecture to which all conference delegates are invited.

In addition, we have an ice-breaker reception and conference banquet to look forward to.

You should have received a copy of the 'Joining Instructions'. If not, it is available from the Conference Staff at registration/help desk. This should answer most if not all of the questions you may have. If it does not, please let conference staff/convenors know.

Our international team of volunteers will be identifiable by their t-shirts. They will be mostly responsible for running the hybrid aspect of our meeting ensuring that our remote participants have a rewarding conference experience.

From the perspective of the Mineralogical Society of the UK and Ireland, our President, Sally Gibson will be present at the conference to greet you. In addition, editors of two of our journals: Roger Mitchell (*Mineralogical Magazine*) and Jon Lloyd (*Geo-Bio Interfaces*) are also going to be in attendance. Make sure to say hello!

Finally, I encourage all delegates to visit the booths of our sponsors/exhibitors and engage with their representatives. Our conference could not run without their support and attendance.

Again, welcome to Baile Atha Cliath (Dublin). Tá súil againn go mbainfidh sibh taitneamh as do bhfuair gcuairt (we hope you enjoy your visit).

David Chew, Emma Tomlinson
Trinity College, Dublin

Russell Rajendra, Kevin Murphy
Mineralogical Society

Maciej Jaranowski
Polish Academy of Sciences, Kraków

Lecture Theatre 5 – O'Cadhain		
Session 18/19. Characterisation of gem materials and their geographic/geological origin		
Session Chairs: Alessandra Costanzo, Isabella Pignatelli, Lee Groat, Giovanna Agrosí		
09.40–10.00	Growth history of a multicoloured tourmaline crystal from the Mavuco gem deposit (Alto Ligoña pegmatite district, NE Mozambique)	Altieri, A., Pezzotta, F., Skogby, H., Hålenius, U. and Bosi, F.
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10.20-10.40	Trace element composition as indicator of prehnite genesis in igneous rocks from Vis Island, Croatia	Topalović, E., Čobić, A., Paradžik, A., Fiket, Ž., Petrinec, Z., Kniewald, G. and Bermanec, V.
10.40-11.00	Baltic Amber Inclusions: a multi-analytical approach to their characterization	Costanzo, A., Bojarski, B., Kosior, M., Klikowicz, A. and Cipriani, M.
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12.00-12.40 KEYNOTE	Why I study Diamonds	Harris, J.W.
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14.00-14.20	Partially crystalline silica varieties in gemmology: The case study of the blue Andean opal	Monico S., Marinoni N., Gatta G.D., Adamo I., Prosperi L., Mácová P. and Ševčík R.
14.20-14.40	Crystallogenetic features of topaz and beryl from chamber pegmatites of Volyn (Ukrainian shield): elements of similarity and differences	Naumko, I.M., Vovk, O.P. and Nedbailo D.R. (REMOTE)

Crystallogenetic features of topaz and beryl from chamber pegmatites of Volyn (Ukrainian shield): elements of similarity and differences

Naumko, I.M.[1], Vovk, O.P.[2], Nedbailo D.R.[2]

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The topaz-morion chamber pegmatites of Volyn are spatially and genetically related to the rapakivi-like granites of the Korosten pluton in the northwestern part of the Ukrainian shield [1] and represent one of the primary sources of jewelry topaz, beryl, and morion in Ukraine.

According to crystal morphology, topaz and beryl from different mineral-structural zones of pegmatites exhibit marked differences. The topaz crystals from the chambers have the richest habit, with seventeen simple forms identified. Among them, the morphologically significant forms are prisms f {011}, y {021}, and d {101}, dipyramids o {111} and u {112}, and pinacoid c {001}. Only seven simple forms were found in other zones, with prism f {011} being the only morphologically significant form observed. Prism f {011} was the sole form observed in metasomatically altered rocks [2]. Beryl crystals from the leaching zones display the richest habit, while those from the chambers exhibit a less diverse morphology [3].

Based on the analysis of the crystal structure, it was determined that the most important simple forms in topaz should be f {011}, b {010}, M {110}, l {120}, d {101}, o {111}, c {001}, y {021}, for beryl - {0001}, {10$\underline{1}$0}, {11$\underline{2}$0}. Such faces should be observed on crystals under any conditions. Thus, all the simple forms mentioned above, except for b {010}, are clearly visible on topaz polyhedra from chambers [2]. For beryls, prisms and pinacoids are morphologically important regardless of the mineral-structural zone [3].

It was found that the crystal morphology of topaz polyhedra becomes poorer with a decrease in temperature; the same applies to beryl [3]. The main mass of topaz was formed during the 2nd acidic period of the post-inversion stage of the pegmatite process at a temperature slightly above 400°C through free crystallization in the chambers and, during metasomatism, in the leaching zones. In metasomatically altered rocks, topaz of the late generation crystallized from low-temperature solutions (180–200 °C) in the 3rd acidic period. The formation of beryl in the chambers occurred at a temperature of about 400 °C. In the leaching zones, the temperature of beryl crystallization was somewhat higher, and in the metasomatically altered rocks beneath the pegmatite body, it reached 500°C due to the influx of ascending high-temperature fluids. Beryl crystallized at a temperature close to that of topaz formation but at slightly different weakly alkaline pH values (7.5–8.5), whereas the pH value of inclusion solutions in topaz usually ranges from 4.3 to 5.6. The pressure at the same time did not exceed 30–40 MPa.

Therefore, clearly individualized crystallomorphologically and genetically, topaz and beryl are typomorphic minerals, reliable indicators of acidity-alkalinity of the fluid environment of mineralogenesis in chamber pegmatites. In view of this, the importance of crystal-morphological and genetic studies of this type of stone-colored raw material, which is important for Ukraine, is undeniable.

References:

[1] Lazarenko Ye et al. (1973) Mineralogy and genesis of chamber permatites of Volyn: 360

[2] Pavlyshyn V et al. (2017) Topaz in the subsoil of Ukraine and in the history of nations: 274

[3] Vovk O (2016) Crystal morphology of topaz and beryl of chamber pegmatites of the Korosten pluton (north-western part of the Ukrainian Shield): 25