Geochemical Atlas – Erzgebirge and Vogtland

Gallium in stream sediments

Gallium (Ga) concentrations are close to a Gaussian distribution and the log values show a left skew. At 5.6 mg/kg, the arithmetic average is not significantly lower than the median of 5.7 mg/kg. The range between absolute maximum (19.8 mg/kg) and minimum contents (0.9 mg/kg) is comparatively small and the contrast between averages of the different rock units is the weakest among all investigated elements. Maximum concentrations of Ga > 10 mg/kg are detected in the southwestern study area, NW and SW of Oelsnitz in regions of Devonian sediments and volcanics. Areas with lower concentration (Ga > 6 mg/kg) are widespread and little impacted by lithological boundaries or mining districts. Examples are Ordovician to Silurian metasediments of the Lößnitz-Zwönitz Syncline, Ordovician phyllites and mica schists of the northern Erzgebirge rim between Stollberg and Augustusburg, and rock units of the Frankenberg Crystalline Complex. Parts of the Eibenstock Granite, Neoproterozoic gneisses NNE of Seiffen and in the Freiberg mining district show similar concentrations. In contrast, regions with Ga levels below-average (Ga < 4 mg/kg) are more clearly delimited: They relate to the granites of Kirchberg and Bergen, to Cambrian metasediments north of the Fichtelgebirge Pluton, and to Neoproterozoic gneisses between Freiberg and Marienberg. Minima (Ga < 2.5 mg/kg) characterise the Fichtelgebirge Pluton, the Tharandt Volcanic Complex and the Altenberg-Teplice Caldera of the eastern Erzgebirge.

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Scale: 1 : 400,000

0 5 10 20 Kilometres

N

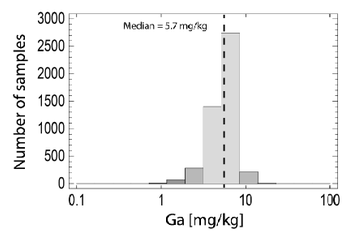
Hainichen, Freiberg, Dippoldiswalde, Altenberg, Zschopau, Stollberg, Sayda, Marienberg, Kirchberg, Schneeberg, Annaberg-Buchholz, Schwarzenberg, Auerbach, Bergen, Oelsnitz, Adorf

Analysed fraction: < 0.18 mm
Analysed by: ALS Minerals
Analytical method: ME-MS41 (Ultra Trace Aqua Regia ICP-MS)

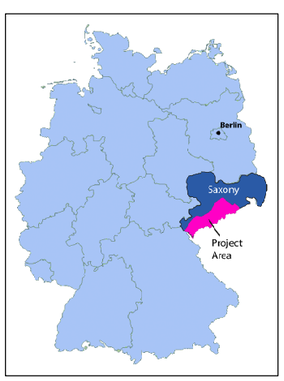
Localities
River
Border D / CZ
Major fault

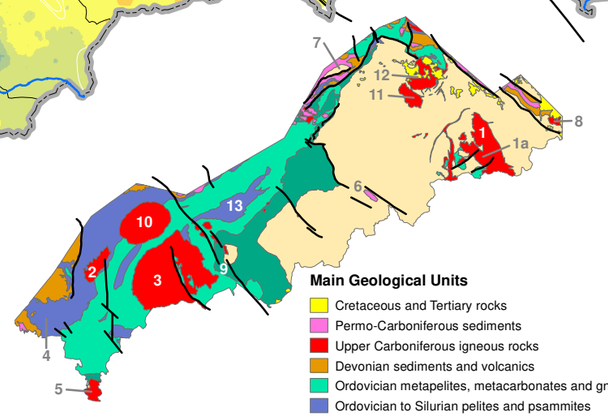
Gallium [mg / kg]

- < 2.0
- 2.0 - 2.5
- 2.5 - 3.2
- 3.2 - 4.0
- 4.0 - 5.0
- 5.0 - 6.3
- 6.3 - 8.0
- 8.0 - 10
- 10 - 13
- 13 -16
- > 16



Number of samples: 4732
Min: 0.9 mg/kg
Max: 19.8 mg/kg
Arithmetic Mean: 5.6 mg/kg
Geometric Mean: 5.3 mg/kg
Median: 5.7 mg/kg





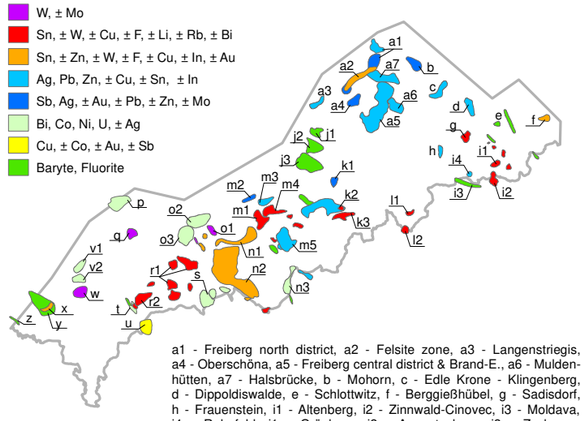
Main Geological Units

- Cretaceous and Tertiary rocks
- Permo-Carboniferous sediments
- Upper Carboniferous igneous rocks
- Devonian sediments and volcanics
- Ordovician metapelites, metacarbonates and gneisses
- Ordovician to Silurian pelites and psammites
- Cambrian to Ordovician metasediments
- Neoproterozoic and Lower Paleozoic gneisses

1 – Altenberg-Teplice-Caldera (incl. 1a - Schellerhau granite), 2 – Bergen Pluton 3 – Eibenstock Pluton, 4 – Eichigt Pluton (concealed), 5 – Fichtelgebirge Pluton, 6 – Flöha Fault Zone, 7 – Frankenberg Crystalline Complex, 8 – Markersbach Pluton, 9 – Gera-Jachymov Fault Zone, 10 – Kirchberg Pluton, 11 – Niederbobritzsch Pluton, 12 – Tharandt Volcanic Complex, 13 – Lößnitz-Zwönitz Syncline

Important Mineral Occurrences

- W, ± Mo
- Sn, ± W, ± Cu, ± F, ± Li, ± Rb, ± Bi
- Sn, ± Zn, ± W, ± F, ± Cu, ± In, ± Au
- Ag, Pb, Zn, ± Cu, ± Sn, ± In
- Sb, Ag, ± Au, ± Pb, ± Zn, ± Mo
- Bi, Co, Ni, U, ± Ag
- Cu, ± Co, ± Au, ± Sb
- Baryte, Fluorite



a1 - Freiberg north district, a2 - Felsite zone, a3 - Langenstriegis, a4 - Oberschöna, a5 - Freiberg central district & Brand-E., a6 - Muldenhütten, a7 - Halsbrücke, b - Mohorn, c - Edle Krone - Klingenberg, d - Dippoldiswalde, e - Schlottwitz, f - Berggießhübel, g - Sadisdorf, h - Frauenstein, i1 - Altenberg, i2 - Zinnwald-Cinovec, i3 - Moldava, i4 - Rehefeld, j1 - Grünberg, j2 - Augustusburg, j3 - Zschopau k1 - Lengefeld, k2 - Marienberg - Wolkenstein, k3 - Pobershau, l1 - Seiffen, l2 - St. Katharinaberg, m1 - Geyer, m2 - Hormersdorf, m3 - Thum, m4 - Ehrenfriedersdorf, m5 - Annaberg-B., n1 - Lauter-Elterlein, n2 - Westerzgebirge complex deposit, n3 - Niederschlag-Bärenstein, o1 - Aue-Bärengrund, o2 - Bad Schlema-Alberoda, o3 - Schneeberg, p - Neumark (U), q - Pechtelsgrün, r1 - Sn Deposits of the Eibenstock Granite, r2 - Gottesberg-Mühlleiten, s - Johanngeorgenstadt, t - Brunndöbra & Schneckenstein, u - Klingenthal-Kraslice, v1 - Zobes, v2 - Bergen, w - Tirpersdorf, x - Oelsnitz, y - Schönbrunn, z - Wiedersberg

Project: Prediction of Strategic High Technology Metals in the Erzgebirge (WISTAMERZ)

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