Table S1. EPMA conditions used for each element. Mnz = monazite; Xtm = xenotime; Ap = apatite; Aln-Czo = allanite-clinozoisite; Hld-Hin = hellandite-hingganite; n.a. = not analysed

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EPMA Bratislava | | | | | EPMA Banská Bystrica | | | | detect. limit (3) in ppm | | | | |
| element | line | crystal | calibrant | Mnz | element | line | crystal | calibrant | Mnz | Xtm | Ap | Aln-Czo | Hld-Hin |
| S | *K* | LPET | baryte | 70-90 | S | *K* | PETL | baryte | 35-40 | 90 | 35-80 | n.a. | n.a. |
| P | *K* | LPET | apatite | 110-120 | Nb | *L* | PETL | LiNbO3 | n.a. | 190 | n.a. | n.a. | n.a. |
| As | *L* | TAP | GaAs | 100 | Ta | *M* | PETH | CrTa2O6 | n.a. | 245 | n.a. | n.a. | n.a. |
| Si | *K* | TAP | wollastonite | 120 | P | *K* | PETL | CePO4 | 60-80 | n.a. | n.a. | n.a. | n.a. |
| Th | *M* | LPET | thorianite | 200-230 | P | *K* | PETL | YPO4 | n.a. | 200 | n.a. | n.a. | n.a. |
| U | *M* | LPET | UO2 | 180-210 | P | *K* | PETL | apatite | n.a. | n.a. | 55-170 | n.a. | n.a. |
| Al | *K* | TAP | Al2O3 | 120 | As | *L* | TAP | GaAs | 105-255 | 1250 | 80-350 | n.a. | n.a. |
| Y | *L* | LPET | YPO4 | 190-220 | Si | *K* | TAP | albite | 65-130 | n.a. | 60-150 | 105 | 280 |
| La | *L* | LLIF | LaPO4 | 850-900 | Si | *K* | TAP | orthoclase | n.a. | 200 | n.a. | n.a. | n.a. |
| Ce | *L* | LLIF | CePO4 | 750-800 | Th | *M* | PETL | monazite | 55-60 | n.a. | 50-70 | 50 | 180 |
| Pr | *L* | LLIF | PrPO4 | 800-850 | Th | *M* | PETL | Th glass | n.a. | 220 | 130 | n.a. | n.a. |
| Nd | *L* | LLIF | NdPO4 | 730-750 | U | *M* | PETL | UO2 | 55-80 | 340 | 60-165 | 65 | 260 |
| Sm | *L* | LLIF | SmPO4 | 800-860 | Ti | *K* | LIF | rutile | n.a. | n.a. | n.a. | 265 | 925 |
| Eu | *L* | LLIF | EuPO4 | 700-740 | Al | *K* | TAP | albite | 45-85 | 150 | 35-115 | 75 | 235 |
| Gd | *L* | LLIF | GdPO4 | 580-610 | Y | *L* | PETL | YPO4 | 70-90 | 315 | 90-215 | 75 | 340 |
| Tb | *L* | LLIF | TbPO4 | 770-810 | La | *L* | LIFH | LaPO4 | 110-150 | 370 | 215 | 105 | 370 |
| Dy | *L* | LLIF | DyPO4 | 720-750 | Ce | *L* | LIFH | CePO4 | 100-140 | 330 | 110-200 | 95 | 340 |
| Ho | *L* | LLIF | HoPO4 | 820-870 | Pr | *L* | LIFH | PrPO4 | 180-250 | 575 | 380 | 165 | 655 |
| Er | *L* | LLIF | ErPO4 | 680-700 | Nd | *L* | LIFH | NdPO4 | 100-145 | 315 | 200 | 90 | 325 |
| Tm | *L* | LLIF | TmPO4 | 580-600 | Sm | *L* | LIFH | SmPO4 | 200-280 | 725 | 460 | 175 | 765 |
| Yb | *L* | LLIF | YbPO4 | 620-640 | Eu | *L* | LIFH | EuPO4 | 100-145 | 340 | n.a. | 110 | 345 |
| Lu | *L* | LLIF | LuPO4 | 690-760 | Gd | *L* | LIFH | GdPO4 | 210-275 | 360 | 185-515 | 180 | 785 |
| Fe | *K* | LIF | fayalite | 300-400 | Tb | *L* | LIFH | TbPO4 | 150-350 | 375 | 260 | 115 | 480 |
| Pb | *M* | LPET | LPET | 100 | Dy | *L* | LIFH | DyPO4 | 120-310 | 395 | 585 | 260 | 885 |
| Sr | *L* | LPET | SrTiO3 | 300-340 | Ho | *L* | LIFH | HoPO4 | 150-330 | 900 | 630 | 260 | 1030 |
| Ca | *K* | LPET | wollastonite | 80 | Er | *L* | LIFH | ErPO4 | 115-170 | 435 | 115-280 | 130 | 430 |
|  |  |  |  |  | Tm | *L* | LIFH | TmPO4 | 120-170 | 455 | 120-180 | 140 | 555 |
|  |  |  |  |  | Yb | *L* | LIFH | YbPO4 | 130-180 | 485 | 120-340 | 145 | 550 |
|  |  |  |  |  | Lu | *L* | LIFH | LuPO4 | 200-300 | 520 | 365 | 150 | 565 |
|  |  |  |  |  | Fe | *K* | LIF | hematite | 185-260 | 510 | 135-355 | 145 | 500 |
|  |  |  |  |  | Mg | *K* | TAP | diopside | n.a. | n.a. | n.a. | 70 | 255 |
|  |  |  |  |  | Mn | *K* | LIF | rhodonite | n.a. | n.a. | 130-375 | 165 | 475 |
|  |  |  |  |  | Pb | *M* | PETL | crocoite | 70-95 | 410 | 125-215 | 80 | 325 |
|  |  |  |  |  | Ba | *L* | LIF | baryte | n.a. | n.a. | 715-1430 | n.a. | n.a. |
|  |  |  |  |  | Sr | *L* | TAP | celestite | 95-195 | n.a. | 105-410 | n.a. | n.a. |
|  |  |  |  |  | Ca | *K* | PETL | apatite | 30-35 | n.a. | 30-80 | n.a. | 95 |
|  |  |  |  |  | Ca | *K* | PETL | diopside | n.a. | 90 | n.a. | 30 | n.a. |
|  |  |  |  |  | Na | *K* | TAP | albite | n.a. | n.a. | 135 | 90 | 280 |
|  |  |  |  |  | K | *K* | PETL | orthoclase | n.a. | n.a. | n.a. | 25 | 75 |
|  |  |  |  |  | Cl | *K* | PETL | tugtupite | n.a. | n.a. | 25-50 | n.a. | n.a. |
|  |  |  |  |  | F | *K* | LDE1 | fluorite | n.a. | n.a. | 105-315 | 210 | 405 |