**Table S1.** *Full list of Wager’s specimens examined, with geographical coordinates*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sample | Rock Type | Long\_E | Lat\_N | Mineral assemblage | Comment |
| ME91 | Bt gneiss + calc-silicate gneiss | 86.8085 | 28.2722 | (1) Pl-Bt-Qz (2) Qz-Pl-Hbl-Ttn(-Di) | mylonitic |
| ME92 | leucogranite | 86.8086 | 28.2721 | Pl-Qz-Kfs-Ms-Bt | mylonitic |
| ME93 | leucogranite | 86.8088 | 28.2721 | Qz-Pl-Kfs-Ms-(Tur-Bt) | mylonitic |
| ME94 | leucogranite | 86.8090 | 28.2722 | Kfs-Qz-Pl-Ms-Tur | less strongly deformed |
| ME95 | Bt gneiss + leucogranite | 86.8091 | 28.2722 | (1) Pl-Qz-Bt-(Tur) (2) Qz-Pl-Kfs (3) Pl-Qz-Di-Hbl-Ttn | mylonitic |
| ME96 | calc-silicate gneiss + Bt gneiss | 86.8092 | 28.2723 | (1) Pl-Qz-Di-Ttn (2) Pl-Qz-Bt | mylonitic |
| ME97 | limestone | 86.8106 | 28.2738 | Cal-Qz-Fsp-Ms-Dol | Qomolangma Formation |
| ME98 | dolerite (altered) | 86.8097 | 28.2730 | Ab-Chl-Cal-Opq | in Qomolangma Formation |
| ME99 | Bt gneiss | 86.8562 | 28.1420 | Pl-Bt-Qz |  |
| ME100 | calc-silicate gneiss | 86.8566 | 28.1428 | Qz-Pl-Di-Grt-Ttn(-Ep) | filled tensional fractures |
| ME101 | Bt gneiss + calc-silicate gneiss | 86.8566 | 28.1428 | (1) Pl-Bt-Qz (2) Pl-Qz-Hbl(-Di)-Ttn |  |
| ME102 | calc-silicate gneiss | 86.8577 | 28.1428 | (1) Ep-Di-Grt-Pl (2) Qz-Pl-Di-Ttn (3) Qz-Pl-Hbl-Ttn |  |
| ME103 | Bt gneiss + calc-silicate gneiss | 86.8592 | 28.1437 | Pl-Qz-Bt; vein: Qz-Pl-Bt |  |
| ME104 | leucogranite pegmatite | 86.8592 | 28.1437 | Kfs-Qz-Pl-Ms |  |
| ME106 | marble | 86.8720 | 28.1121 | Cal-Di-Scp-Pl-Phl-Ttn |  |
| ME107 | granite gneiss | 86.8460 | 28.1319 | Qz-Pl-Kfs-Bt | loose blocks in lateral moraine |
| ME108 | leucogranite | 86.8421 | 28.1310 | Kfs-Pl-Qz-Ms-Bt | thick (>150 m) sheet |
| ME109 | tourmaline-quartz rock | 86.8460 | 28.1319 | (1) Qz-Kfs-Ms (2) Qz-Tur | with pegmatite, nearly *in situ* |
| ME110 | calc-silicate gneiss | 86.8658 | 28.1301 | Di-Scp-Kfs-Pl-Cal-Ttn | among leucogranite sheets |
| ME111 | leucogranite | 86.8658 | 28.1301 | Kfs-Pl-Qz-Ms-Tur-Bt |  |
| ME112 | calc-mica schist | 86.8658 | 28.1301 | (1) Pl-Bt-Qz (2) Pl-Qz-Bt-Hbl-Di-Ttn | microfolded, banded Bt vs Hbl-Di |
| ME113 | leucogranite | 86.8871 | 28.0946 | Kfs-Pl-Qz-Bt-Tur-Ms | thick (>100 m) sheet |
| ME114 | marble | 86.8847 | 28.1024 | Cal-Di-Scp-Ttn |  |
| ME115 | leucogranite | 86.8858 | 28.1056 | Pl-Kfs-Qz-Ms-Bt | thick (~120 m) sheet |
| ME116 | marble | 86.8842 | 28.1035 | Cal-Di-Scp(-Pl?)-Ttn |  |
| ME117 | leucogranite + calc-silicate gneiss | 86.8842 | 28.1035 | (1) Qz-Pl-Kfs-Hbl-Bt (2) Pl-Cal-Di | 15 cm leucogranite cuts gneiss |
| ME118 | leucogranite pegmatite | 86.8842 | 28.1035 | Kfs-Qz-Pl-Tur | 20 cm concordant sheet |
| ME119 | calc-silicate gneiss | 86.8842 | 28.1035 | Kfs-Scp-Pl-Di-Qz-Ttn |  |
| ME120 | calc-silicate gneiss | 86.8842 | 28.1035 | (1) Di-CaPl-Qz-Ttn (2) Scp-Di-Pl-Vsv-Qz-Ttn | bands of very coarse vesuvianite |
| ME121 | Bt gneiss | 86.9305 | 28.0237 | Pl-Qz-Bt-Opq |  |
| ME122 | leucogranite pegmatite | 86.9305 | 28.0237 | Kfs-Qz-Pl-Ms | 5 cm thick, in Bt gneiss |
| ME123 | tourmaline-quartz rock | 86.9305 | 28.0237 | Qz-Tur | at contact felsic vein and Bt gneiss |
| ME124 | limestone | 86.9301 | 27.9943 | Cal-Qz-Dol-Ms-Opq | Qomolangma Formation |
| ME125 | marble | 86.9329 | 27.9993 | Cal-Qz-Fsp-Ms | Yellow Band |
| ME126 | calc-phyllite | 86.9324 | 28.0008 | (1) Ms-Pl-Qz-Bt-Cal-Opq (2) Pl-Cal-Qz-Ms-Bt-Opq | filled tensional fractures |
| ME127 | Bt gneiss + felsic vein | 86.9283 | 28.0084 | (1) Kfs-Pl-Qz-Ms (2) Tur-Qz-Ap (3) Qz-Fsp-Bt-Ms-Chl-Opq-Tur | filled tensional fractures |
| ME128 | Bt gneiss | 86.9294 | 28.0068 | Qz-Ab-Cal-Bt-Chl-Opq-Tur-Aln-Zrn | fine-grained, with carbonate |
| ME129 | hydrothermal vein | 86.9262 | 28.0128 | Qz-Fsp-Chl-sulfide | with copper staining, in Bt gneiss |
| ME130 | tourmaline-quartz rock | 86.9305 | 28.0237 | (1) Qz-Tur (2) Pl-Bt-Qz | tourmaline veins cutting Bt gneiss |
| ME131 | Bt gneiss + calc-silicate gneiss | 86.9305 | 28.0237 | (1) Pl-Qz-Bt (2) Qz-Pl-Hbl-Ep-Ttn |  |
| ME132 | marble | 86.9376 | 28.0290 | Cal-Di-Scp-Fsp |  |
| ME133 | sillimanite schist | 86.9402 | 28.0300 | Qz-Pl-Bt-Sil-Ms(-Chl) | microfolded |
| ME134 | mica schist | 86.9402 | 28.0300 | Pl-Qz-Bt-Ms |  |
| ME135 | calc-silicate gneiss | 86.9402 | 28.0300 | Qz-Pl-Hbl-Ep-Ttn | filled tensional fractures |
| ME136 | Bt gneiss | 86.9402 | 28.0300 | Qz-Pl-Bt-Opq | filled tensional fractures |
| ME137 | calc-silicate gneiss | 86.9402 | 28.0300 | (1) Pl-Bt-Qz (2) Qz-Bt-Chl-Pl  (3) Cal-Bt/Chl-Pl-Qz | filled tensional fractures |
| ME138 | marble | 86.9402 | 28.0300 | (1) Cal-Pl-Qz-Bt-Opq (2) Pl-Bt-Qz (3) Pl-Bt-Chl-Qz-Tur-Ep-Ttn-Opq | with thin boudinaged Bt gneiss layers |
| ME141 | Bt gneiss | 86.9402 | 28.0300 | Qz-Pl-Bt-accessories | filled tensional fractures |
| ME142 | Bt gneiss | 86.9402 | 28.0300 | (1) Pl-Qz-Ms-Bt (2) Cal-Fsp-Qz-Bt | fine-grained, with carbonate |
| ME143 | Bt gneiss + calc-silicate gneiss | 86.9402 | 28.0300 | (1) Qz-Pl-Bt-Opq (2) Qz-Pl-Hbl-Ttn-Bt-Opq | |
| ME144 | marble | 86.9402 | 28.0300 | Cal-Qz-?Fsp-Ms-Phl-Opq | Yellow Band |
| ME147 | Bt gneiss + calc-silicate gneiss | 86.9601 | 28.0364 | (1) Pl-Qz-Bt(-Chl)-Ttn (2) Pl-Qz-Hbl-Kfs-Ttn | filled tensional fractures |
| ME148 | Gt-St-Sil schist | 86.9628 | 28.0381 | Pl-Qz-Bt-Ms-St-Sil-Grt | microfolded; Qz stringers |
| ME149 | Gt-St-Sil schist | 86.9624 | 28.0378 | Pl-Qz-Bt-Ms-St-Sil-Grt | Qz stringers |
| ME150 | mica schist | 86.9609 | 28.0367 | Pl-Qz-Bt-Ms-Tur-Sil | microfolded |
| ME151 | Grt-mica schist | 86.9576 | 28.0358 | Qz-Pl-Kfs-Bt-Ms-Grt | fine-grained; rotational garnets |
| ME152 | leucogranite pegmatite | 86.9584 | 28.0360 | Kfs-Pl-Qz | cuts marble |
| ME153 | leucogranite + marble | 86.9584 | 28.0360 | (1) Kfs-Qz-Pl-Hbl-(Chl-Ep)  (2) Cal-Di-Scp-Pl-Kfs | filled tensional fractures |
| ME154 | sillimanite schist | 86.9571 | 28.0356 | Qz-Pl-Bt-Ms-Sil(-Chl) | microfolded; Qz stringers |
| ME156 | Bt gneiss + calc-silicate gneiss | 86.8111 | 28.2810 | (1) Pl-Bt-Qz;  (2) Qz-Pl-Di-Hbl-Ttn | banded mylonite; locality uncertain |

ME133-ME144 derived from Changtse S face; collected from lateral moraine near Camp III and ME132, coordinates of collection, very approximate.

Minerals in assemblages are listed in order of decreasing abundance; multiple assemblages are listed for banded or otherwise heterogeneous rocks.