**Table S1. Compilation of geochemical data and reference for the Emeishan basalts and mafic intrusions.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Location | East Longitude | North Latitude | La/Yb | Sm/Yb | Quantity of data | Rock types | References |
| 1 | Jin’an, Lijiang, Yunnan | 100.411 | 26.794 | 15.82 | 3.68 | 22 | Emeishan basalt-HT | Wang et al., 2013 |
| 2 | Hutiaoxia, Lijiang, Yunnan | 100.153 | 27.238 | 16.55 | 3.80 | 3 | Emeishan basalt-HT | Wang et al., 2013 |
| 3 | Yapai, Funing, Yunnan | 105.605 | 23.596 | 13.43 | 3.38 | 25 | Mafic dyke-HT | Zhou et al., 2006 |
| 4 | Yapai, Funing, Yunnan | 105.605 | 23.596 | 4.99 | 1.26 | 24 | Mafic dyke-LT | Zhou et al., 2006 |
| 5 | Yapai, Funing, Yunnan | 105.605 | 23.596 | 6.60 | 1.48 | 5 | Emeishan basalt-LT | Zhou et al., 2006 |
| 6 | Zhaotong, Yunnan | 103.757 | 27.356 | 15.12 | 3.67 | 89 | Emeishan basalt-HT | Li J et al., 2017 |
| 7 | Shuanglang, Binchuan, Yunnan | 100.209 | 25.912 | 11.75 | 2.39 | 4 | Emeishan basalt-LT | Huang et al., 2022a |
| 8 | Fumin, Yunnan | 102.657 | 25.284 | 14.66 | 3.79 | 7 | Emeishan basalt/mafic dyke-HT | Li et al., 2015a |
| 9 | Langmao, Luquan, Yunnan | 102.452 | 25.843 | 19.22 | 4.64 | 7 | Emeishan basalt-HT | Unpublished data |
| 10 | Luobugu, Huize, Yunnan | 103.556 | 26.723 | 13.73 | 4.01 | 8 | Emeishan basalt-HT | Jiang et al.,2009 |
| 11 | Naoyingyan, Ludian, Yunnan | 103.465 | 27.132 | 14.28 | 3.40 | 9 | Emeishan basalt-HT | Jiang et al.,2009 |
| 12 | Shangcang, Binchuan, Yunnan | 100.424 | 25.813 | 13.44 | 3.35 | 7 | Emeishan basalt-HT | Jiang et al.,2009 |
| 13 | Shangcang, Binchuan, Yunnan | 100.424 | 25.813 | 9.34 | 2.81 | 8 | Emeishan basalt-LT | Jiang et al.,2009 |
| 14 | Renhechang, Yanjin, Yunnan | 104.215 | 28.136 | 14.55 | 3.14 | 8 | Emeishan basalt-HT | Ma et al., 2019 |
| 15 | Fazhe, Dongchuan, Yunnan | 103.095 | 26.078 | 7.33 | 1.76 | 3 | Emeishan basalt-HT | Tian et al. 2017 |
| 16 | Fuliangshan, Qiaojia, Yunnan | 103.042 | 27.068 | 13.78 | 3.62 | 2 | Emeishan basalt-HT | Tian et al. 2017 |
| 17 | Yongshan, Zhaotong, Yunnan | 103.310 | 27.621 | 12.90 | 3.43 | 9 | Emeishan basalt-HT | Tan, 2019 |
| 18 | Lijiang, Yunnan | 100.338 | 26.883 | 9.18 | 2.02 | 4 | Emeishan basalt-HT | Yi et al., 2022 |
| 19 | Fazhe, Dongchuan, Yunnan | 103.095 | 26.078 | 14.91 | 4.07 | 20 | Emeishan basalt-HT | Song et al., 2008 |
| 20 | Wuding, Yunnan | 102.378 | 25.548 | 13.11 | 3.24 | 26 | Mafic dyke-HT | Fan et al., 2017 |
| 21 | Binchuan, Yunna | 100.472 | 25.861 | 5.99 | 2.02 | 29 | Emeishan basalt-HT | Xiao et al., 2004 |
| 22 | Binchuan, Yunna | 100.472 | 25.861 | 15.02 | 3.55 | 13 | Emeishan basalt-HT | Xiao et al., 2004 |
| 23 | Wuxing, Huize, Yunnan | 103.377 | 26.561 | 13.53 | 3.49 | 4 | Emeishan basalt-HT | Gong, 2017 |
| 24 | Jinjia, Huize, Yunnan | 103.318 | 26.412 | 14.35 | 3.2 | 5 | Emeishan basalt-HT | Gong, 2017 |
| 25 | Wuxing, Huize, Yunnan | 103.313 | 26.621 | 13.72 | 3.04 | 7 | Emeishan basalt-HT | Gong, 2017 |
| 26 | Jianchuan, Yunnan | 99.912 | 26.543 | 9,.77 | 3.07 | 11 | Emeishan basalt-LT | Song et al., 2001 |
| 27 | Yanjin, Zhaotong, Yunnan | 104.228 | 28.029 | 16.93 | 4.25 | 9 | Emeishan basalt-HT | Xi et al., 2019 |
| 28 | Xiaoguanzi, Baoxing, Sichuan | 102.793 | 30.290 | 14.58 | 3.49 | 8 | Emeishan basalt-HT | Unpublished data |
| 29 | Huilongchang, Leibo, Sichuan | 104.018 | 28.165 | 13.59 | 3.15 | 10 | Emeishan basalt-HT | Liu et al., 2020 |
| 30 | Shaqiang, Mabian, Sichuan | 103.413 | 28.777 | 15.75 | 3.76 | 15 | Emeishan basalt-HT | Yang et al., 2018 |
| 31 | Muchuan, Sichuan | 103.861 | 28.858 | 13.49 | 4.23 | 12 | Emeishan basalt-HT | Cheng et al., 2019 |
| 32 | Caochang, Miyi, Sichuan | 102.058 | 26.917 | 12.3 | 2.99 | 6 | Mafic dyke-LT | Zou et al., 2022 |
| 33 | Caojiacun, Sichuan | 101.950 | 27.073 | 9.88 | 3.26 | 25 | Mafic dyke-LT | Munteanu et al., 2017 |
| 34 | Panzhihua, Sichuan | 101.624 | 26.581 | 17.99 | 4.67 | 3 | Emeishan basalt-HT | Shellnutt & Jahn, 2011 |
| 35 | Miaogaoshan, Mianning, Sichuan | 102.110 | 28.511 | 12.46 | 3.35 | 4 | Emeishan basalt-HT | Li et al., 2012; unpublished data |
| 36 | Miaogaoshan, Mianning, Sichuan | 102.110 | 28.511 | 8.82 | 2.14 | 2 | Emeishan basalt-LT | Li et al., 2012; unpublished data |
| 37 | Miyi, Sichuan | 102.053 | 27.018 | 15.78 | 3.98 | 4 | Emeishan basalt-HT | Yi et al., 2022 |
| 38 | Emei, Sichuan | 103.356 | 29.573 | 14.3 | 3.71 | 7 | Emeishan basalt-HT | Yi et al., 2022 |
| 39 | Daqiao, Huidong, Sichuan | 102.852 | 26.656 | 17.40 | 4.16 | 17 | Emeishan basalt-HT | Cheng, 2014 |
| 40 | Er’tan, Sichuan | 101.797 | 26.839 | 24.06 | 5.19 | 5 | Emeishan basalt-HT | Sun et al., 2021 |
| 41 | Jinding, Emei, Sichuan | 103.342 | 29.528 | 14.58 | 3.69 | 7 | Emeishan basalt-HT | Xu et al., 2007 |
| 42 | Longzhoushan, Yanbian, Sichuan | 102.187 | 26.807 | 17.02 | 3.95 | 6 | Emeishan basalt-HT | Xu et al., 2007 |
| 43 | Longzhoushan, Yanbian, Sichuan | 102.187 | 26.807 | 17.22 | 4.27 | 22 | Emeishan basalt-HT | Qi & Zhou, 2008 |
| 44 | Puxiong, Yuexi, Sichuan | 102.664 | 28.559 | 16.68 | 4.17 | 9 | Emeishan basalt-HT | Zhang, 2016 |
| 45 | Yanyuan, Sichuan | 101.697 | 27.370 | 11.74 | 3.38 | 9 | Emeishan basalt-HT | Sun, 2013 |
| 46 | Yanyuan, Sichuan | 101.697 | 27.370 | 9.97 | 2.73 | 26 | Emeishan basalt-LT | Sun, 2013 |
| 47 | Yumen, Yanbian, Sichuan | 101.374 | 27.057 | 11.74 | 3.04 | 5 | Emeishan-HT | Yao et al., 2021 |
| 48 | Longchi, Emei, Sichuan | 103.294 | 29.427 | 15.28 | 3.87 | 9 | Emeishan basalt-HT | This study |
| 49 | Qingyingu, Emei, Sichuan | 103.414 | 29.578 | 15.99 | 3.83 | 5 | Emeishan basalt-HT | This study |
| 50 | Xingyang, Emei, Sichuan | 103.485 | 29.481 | 13.94 | 3.77 | 7 | Emeishan basalt-HT | This study |
| 51 | Sixing, Leshan, Sichuan | 103.560 | 29.457 | 16.15 | 3.84 | 5 | Emeishan basalt-HT | This study |
| 52 | Houshan, Linshui, Sichuan | 106.842 | 30.325 | 11.90 | 2.79 | 6 | Emeishan basalt-HT | This study |
| 53 | Pianyanzi, Huaying, Sichuan | 106.783 | 30.304 | 11.86 | 2.61 | 6 | Emeishan basalt-HT | This study |
| 54 | Shawan, Emei, Sichuan | 103.441 | 29.372 | 15.62 | 4.39 | 13 | Emeishan basalt-HT | Xi et al., 2019 |
| 55 | Drillhole (TD004-1) | 107.540 | 30.720 | 10.72 | 2.55 | 4 | Emeishan basalt-HT | Liu et al., 2022 |
| 56 | Drillhole  (YT-1) | 104.470 | 30.552 | 16.04 | 4.01 | 4 | Emeishan basalt-HT | Liu et al., 2022 |
| 57 | Drillhole  (ZG-1) | 103.000 | 29.750 | 15.14 | 3.80 | 5 | Emeishan basalt-HT | Liu et al., 2022 |
| 58 | Drillhole  (JS-1) | 103.820 | 29.246 | 15.59 | 3.82 | 4 | Emeishan basalt-HT | Liu et al., 2022 |
| 59 | Drillhole  (ZJ-1) | 104.683 | 30.572 | 17.52 | 4.36 | 4 | Emeishan basalt-HT | Liu et al., 2022 |
| 60 | Drillhole  (YS-1) | 103.950 | 30.540 | 13.37 | 3.24 | 15 | Emeishan basalt-HT | Chen et al., 2019; Xi et al., 2019 |
| 61 | Shiping, Hezhang, Guizhou | 104.538 | 27.276 | 15.56 | 4.15 | 6 | Emeishan basalt-HT | Qin et al., 2018 |
| 62 | Douge, Shuicheng, Guizhou | 104.705 | 26.374 | 14.26 | 3.47 | 5 | Emeishan basalt-HT | Zhu et al., 2019 |
| 63 | Heishitou, Weining, Guizhou | 103.983 | 26.783 | 13.52 | 3.57 | 44 | Emeishan basalt-HT | Qi & Zhou, 2008 |
| 64 | Yushajing, Puan, Guizhou | 104.861 | 25.435 | 13.44 | 3.46 | 4 | Emeishan basalt-HT | Ji et al., 2021 |
| 65 | Zhijin, Guizhou | 105.731 | 26.550 | 15.72 | 4.02 | 10 | Emeishan basalt-HT | Lai et al., 2012; Xu et al., 2007 |
| 66 | Xiaotun, Dafang, Guizhou | 105.578 | 27.043 | 14.72 | 3.61 | 7 | Emeishan basalt-HT | Lin, 2017 |
| 67 | Yangyu-Pingxu, Baise, Guangxi | 106.450 | 23.926 | 11.50 | 3.03 | 14 | Emeishan basalt-HT | Fan et al., 2008 |
| 68 | Min'an, Bama, Guangxi | 107.337 | 24.082 | 12.77 | 3.4 | 14 | Emeishan basalt-HT | Fan et al., 2008 |
| 69 | Yufeng, Tianyang, Guangxi | 107.110 | 23.970 | 13.05 | 3.45 | 12 | Emeishan basalt-HT | Fan et al., 2008 |
| 70 | Longchuan, Guangxi | 106.816 | 24.120 | 8.35 | 2.34 | 6 | Emeishan basalt-HT | Liu et al., 2017 |
| 71 | Napo, Guangxi | 105.631 | 23.338 | 11.9 | 3.28 | 5 | Mafic dyke-HT | Li et al., 2019 |
| 72 | Natao, Bama, Guangxi | 107.348 | 24.024 | 13.37 | 3.29 | 15 | Mafic dyke-HT | Wu et al., 2023 |
| 73 | Yixu, Bama, Guangxi | 107.464 | 24.077 | 10.96 | 2.88 | 2 | Mafic dyke-HT | Wu et al., 2023 |
| 74 | Yandong, Bama, Guangxi | 107.170 | 24.029 | 8.53 | 2.50 | 3 | Mafic dyke-HT | Wu et al., 2023 |