Costa Rican Glass Compositions

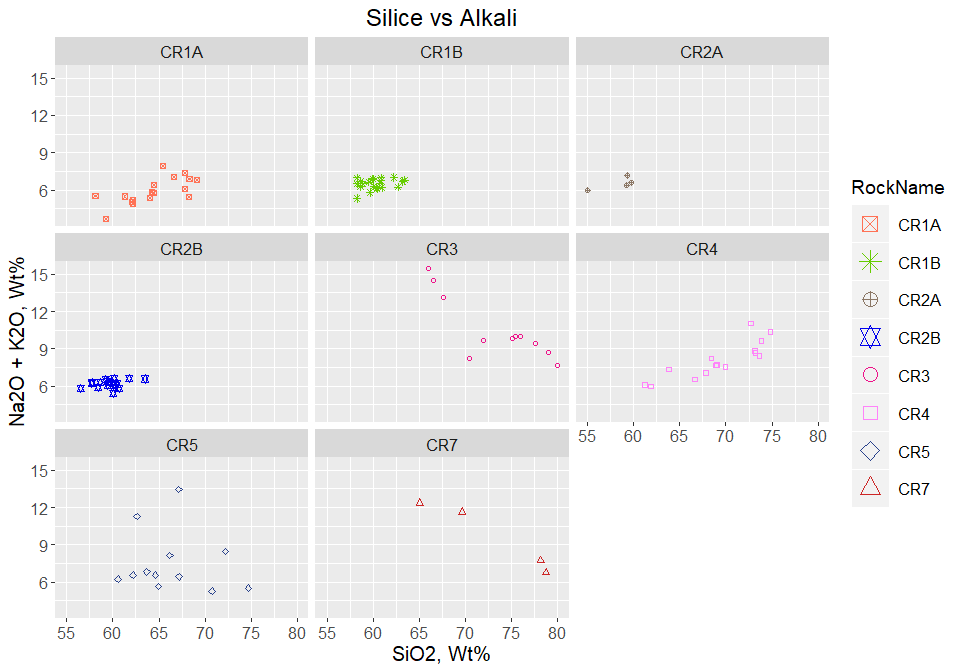
Julie M. Coulombe

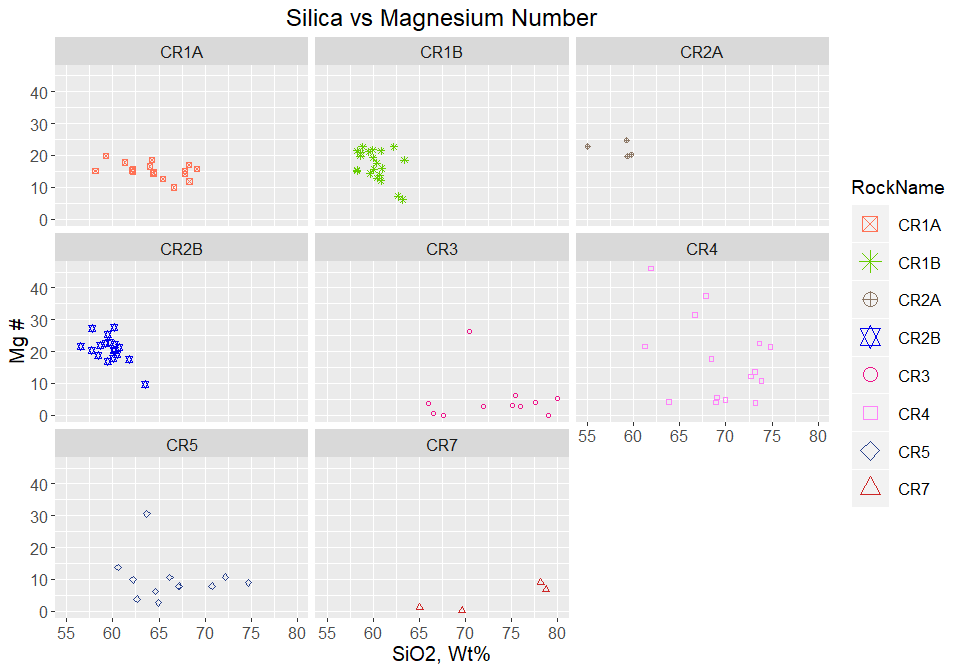
2/25/2020

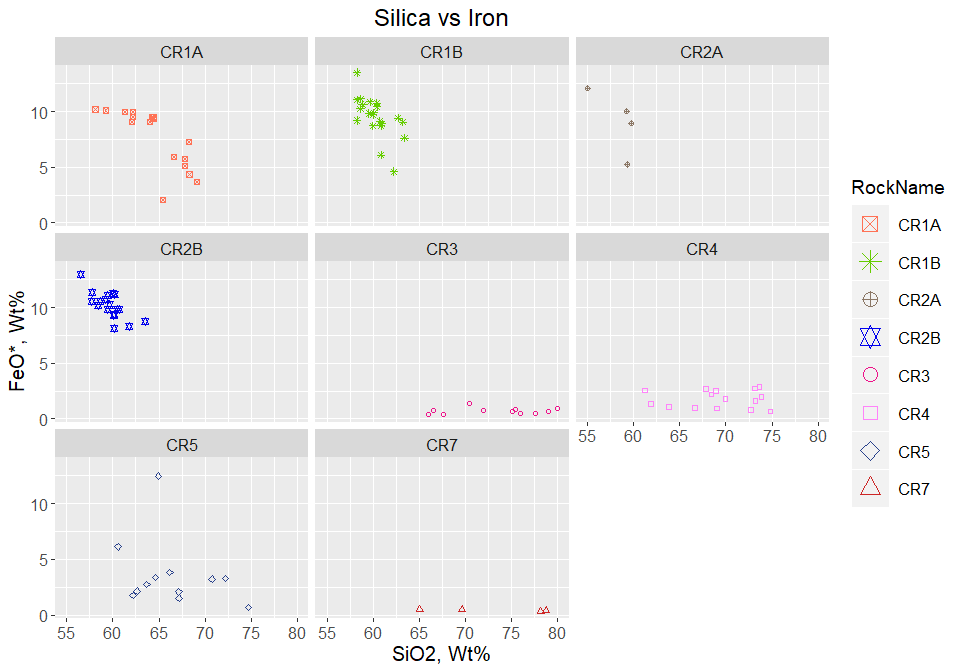
An analysis of volcanic glass sampled from the Tajo La Florida quarry at Barva Volcano in Costa Rica. Samples collected are from potentially different lava flows. Data was acquired by using an electron microprobe.

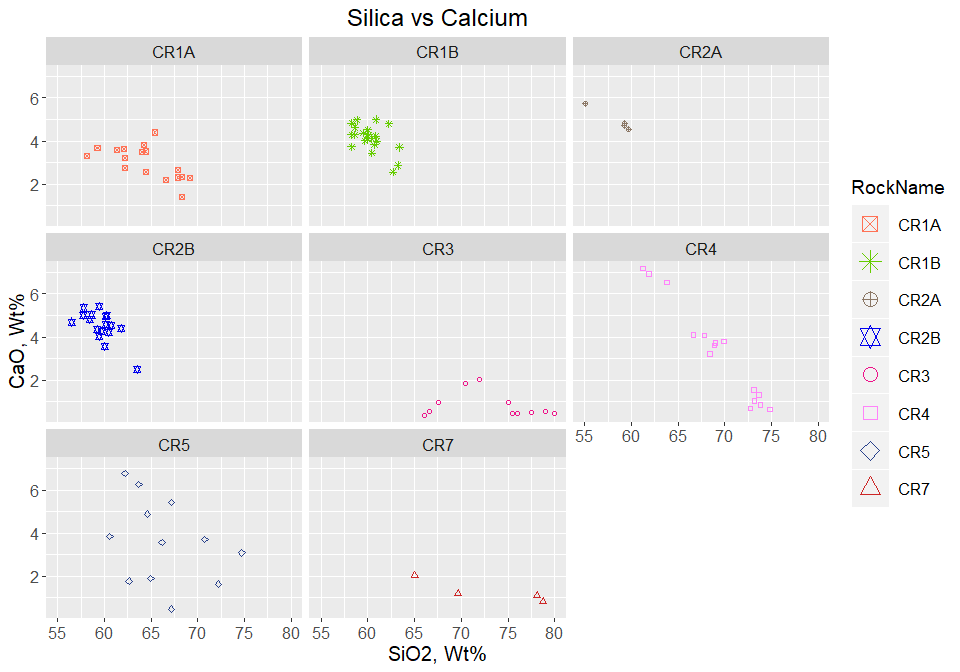
Data points were constrained as follows:

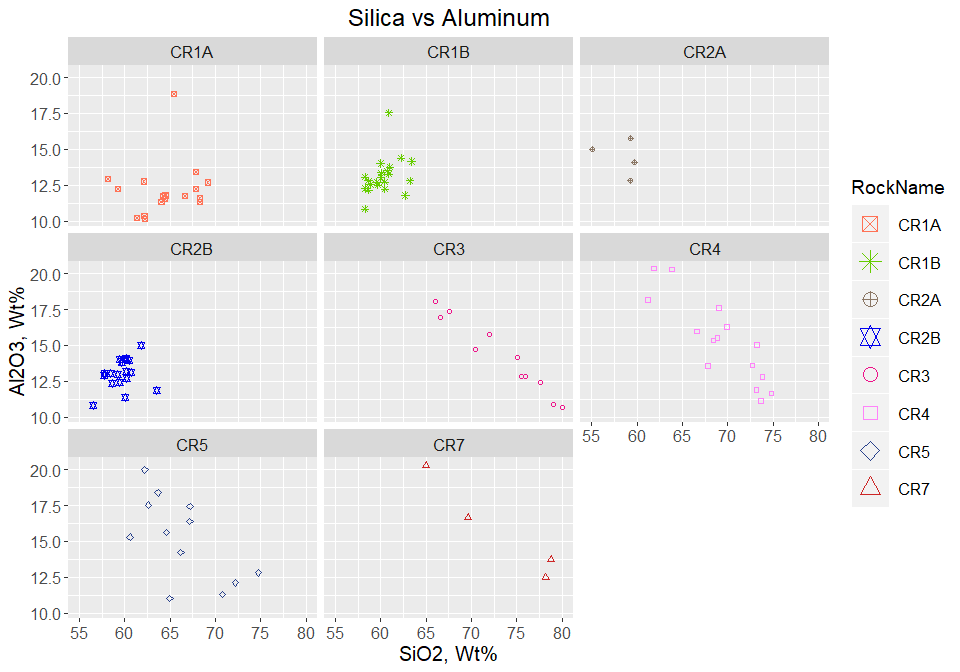
Wt% Totals > 95.0 and < 101.0  
SiO2 < 90.0 and > 40.0 Al2O3 > 10.0 and < 22.0  
K2O > 1.0

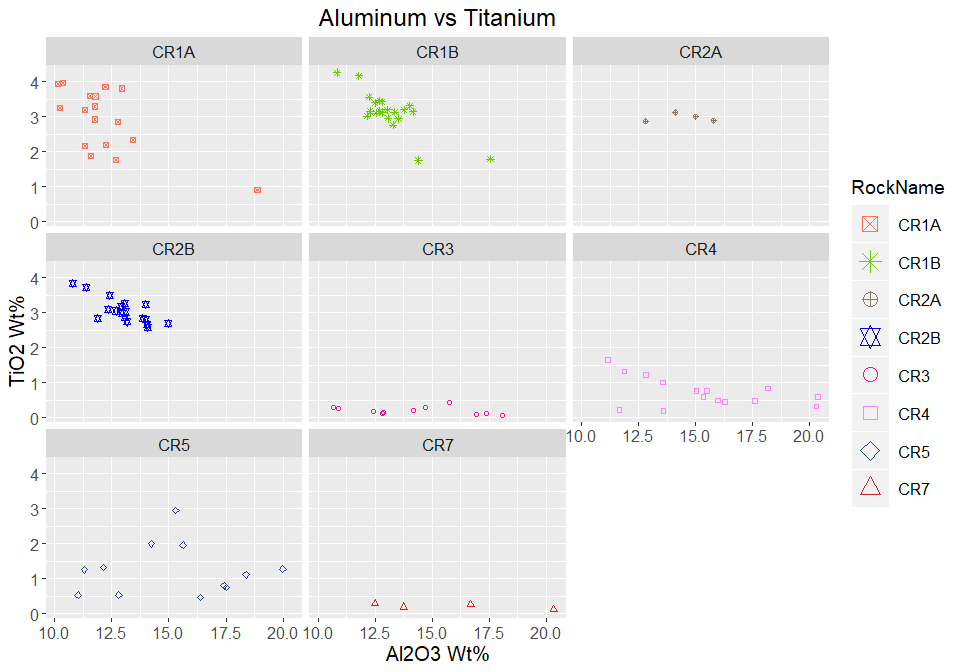




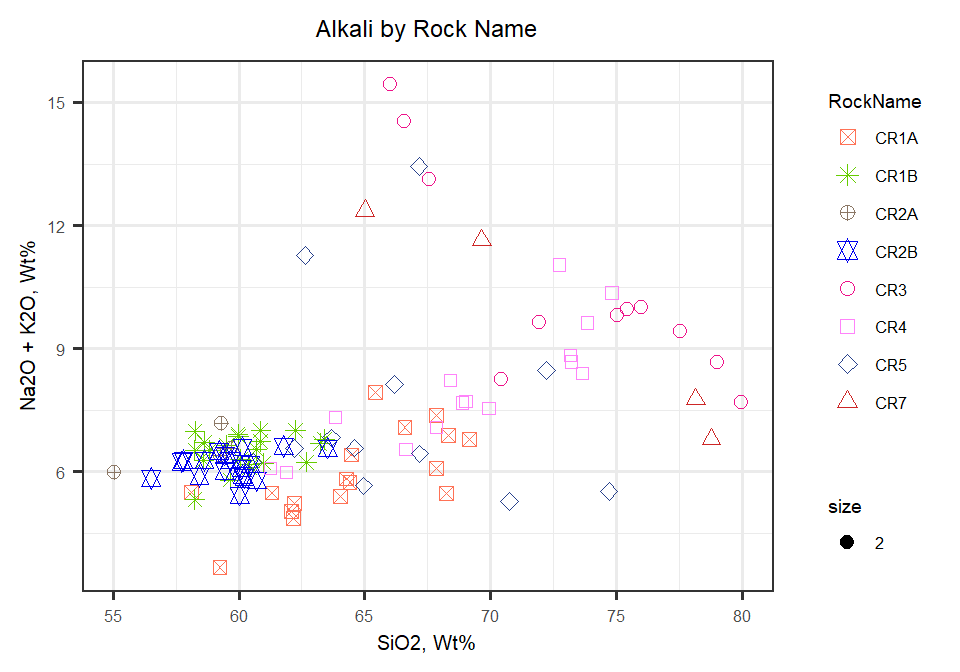


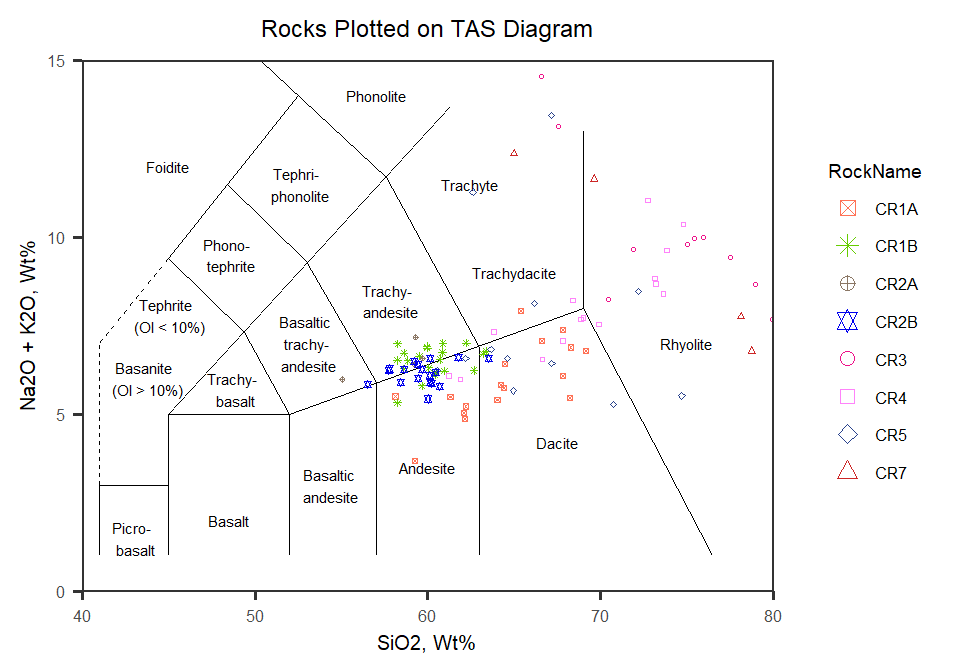




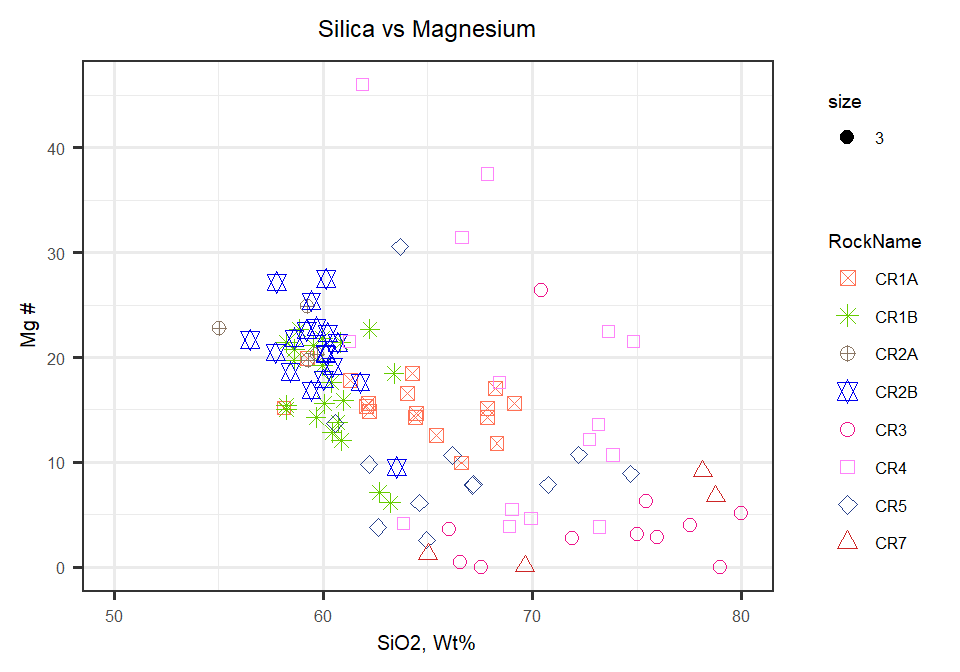


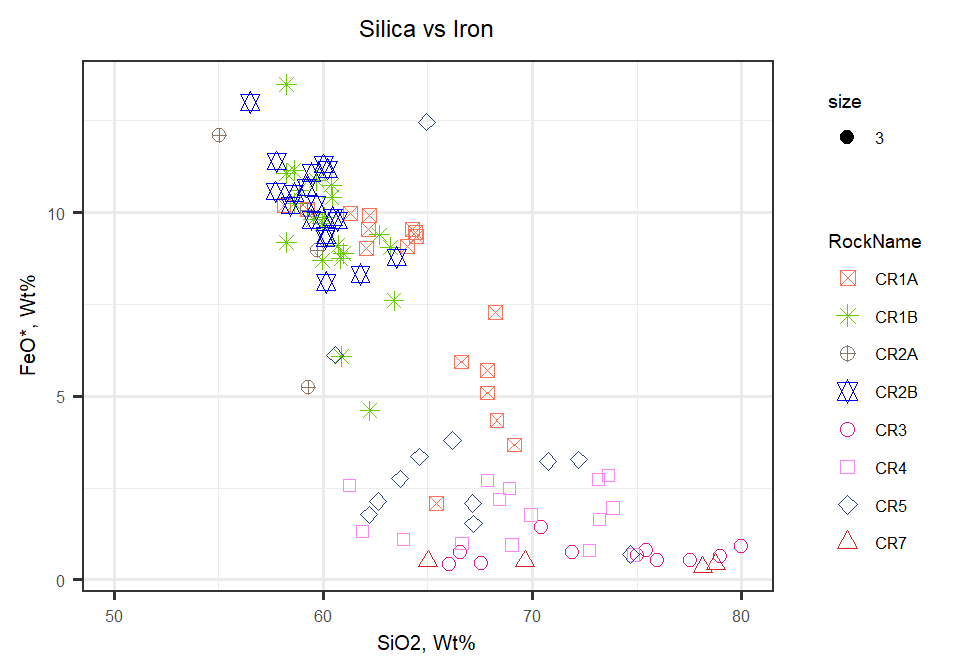
Plot Alkali by Rock Name

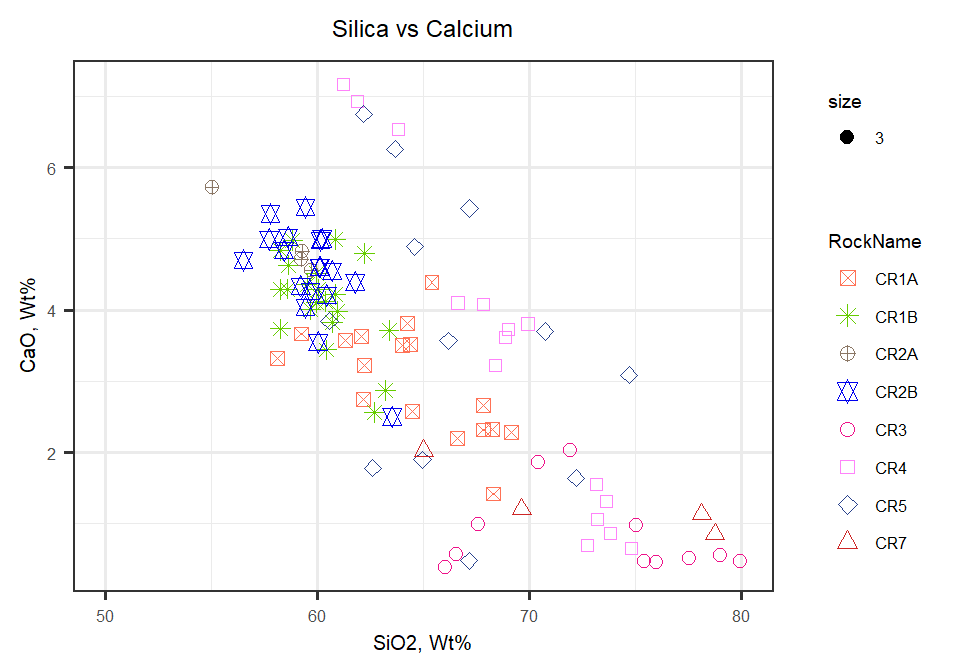


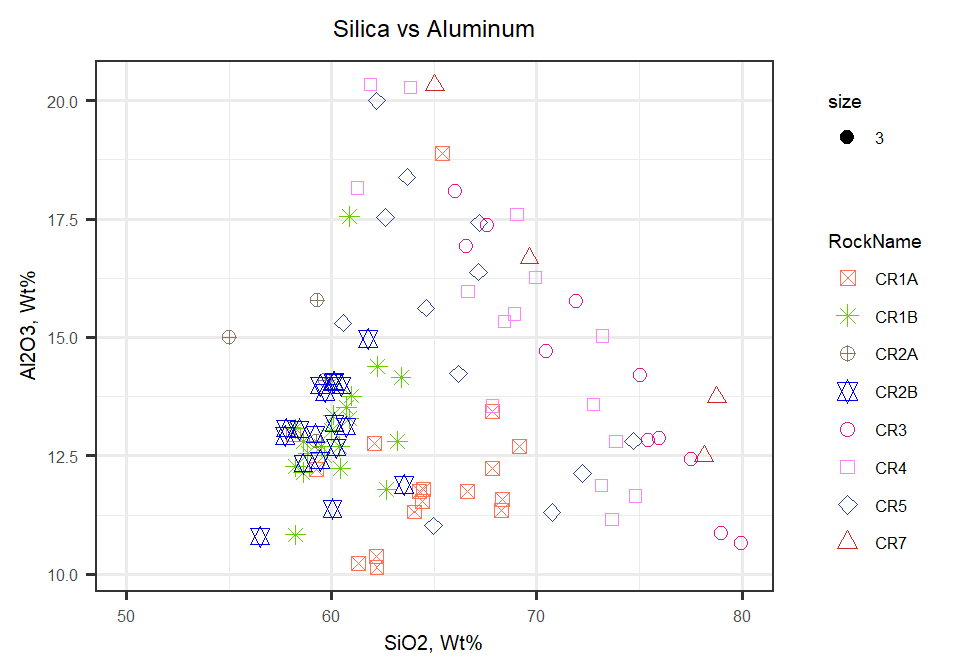


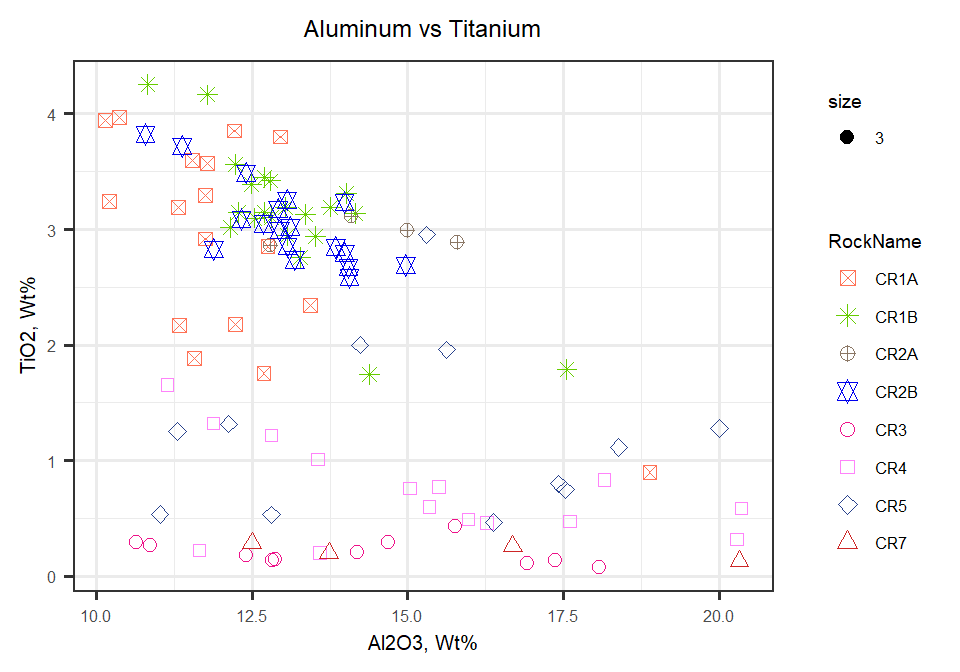
Now to look at plots of all rocks together











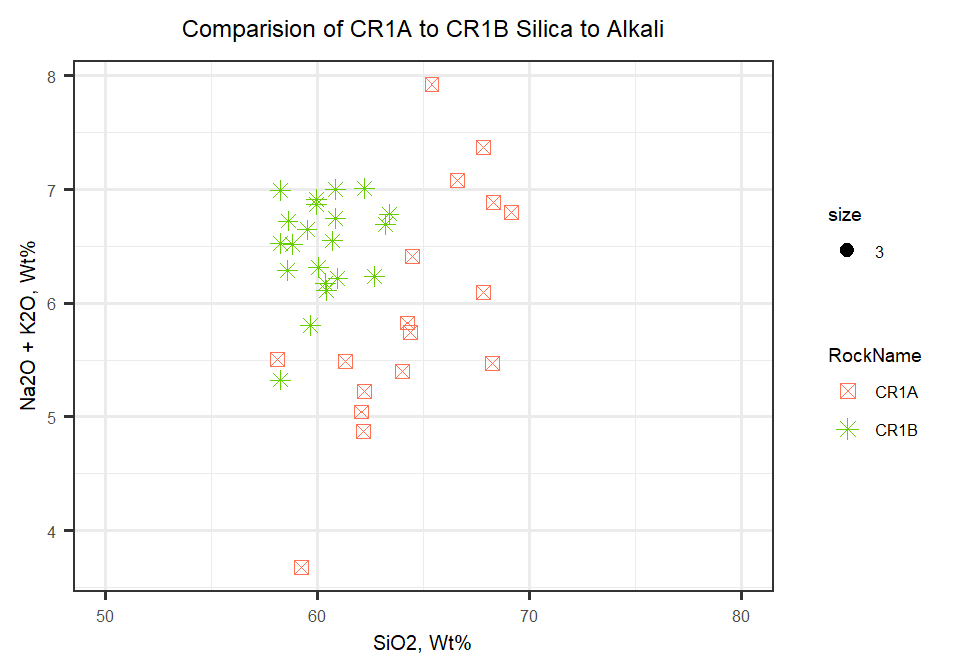
A table comparing mean and standard deviation of Aluminum and Titanium

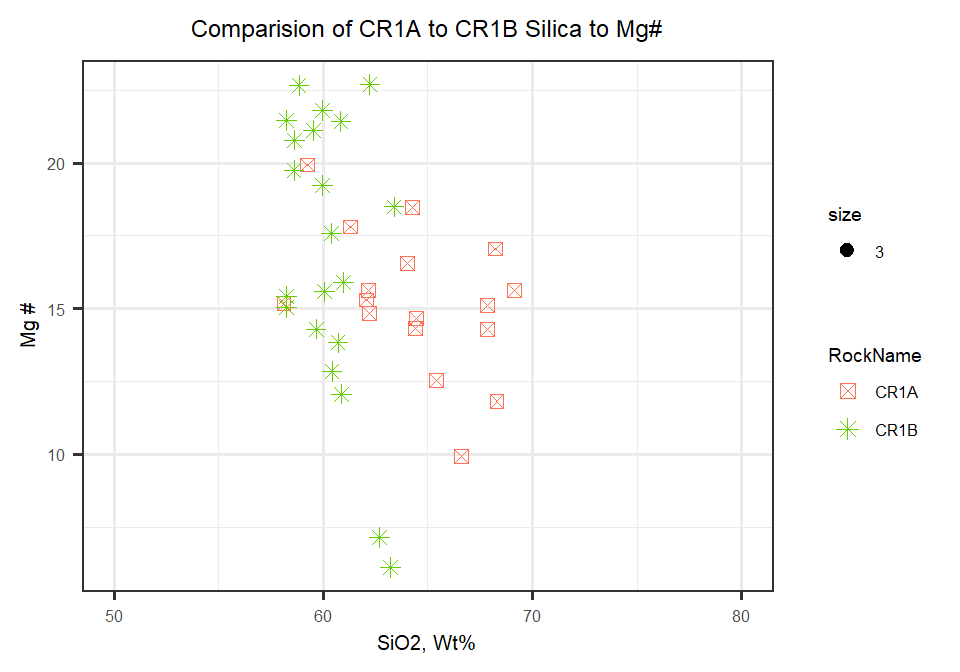
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RockName** | **Al2O3mn** | **Al2O3sd** | **TiO2mn** | **TiO2sd** |
| CR1A | 12.174 | 1.964 | 2.910 | 0.899 |
| CR1B | 13.117 | 1.314 | 3.139 | 0.581 |
| CR2A | 14.424 | 1.282 | 2.965 | 0.115 |
| CR2B | 13.036 | 1.042 | 3.047 | 0.353 |
| CR3 | 14.239 | 2.563 | 0.206 | 0.104 |
| CR4 | 15.275 | 2.924 | 0.729 | 0.421 |
| CR5 | 15.177 | 2.920 | 1.247 | 0.744 |
| CR7 | 15.810 | 3.481 | 0.219 | 0.072 |

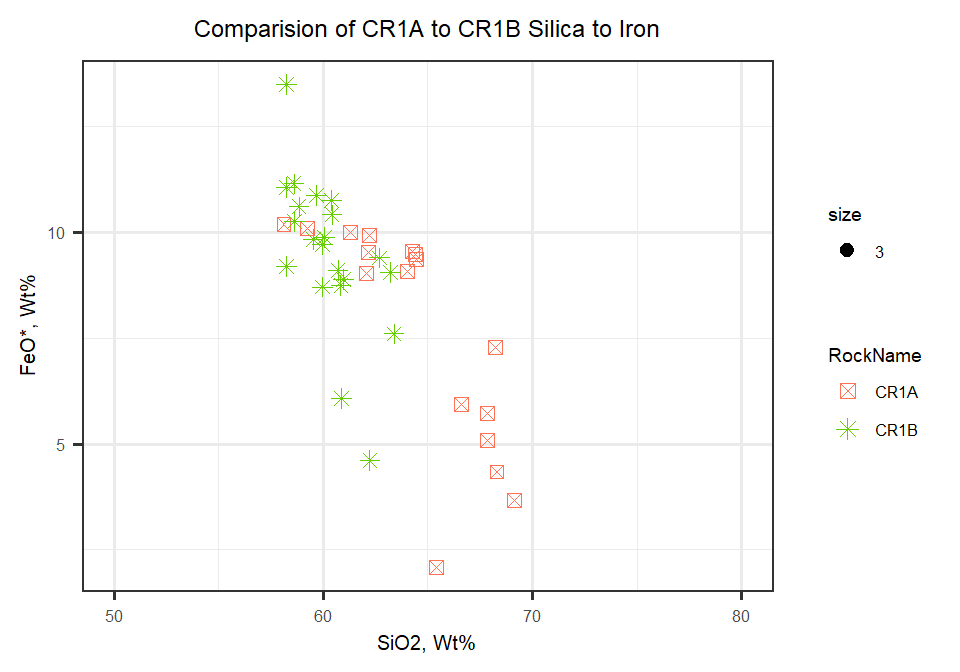
Table laying out representative glass samples

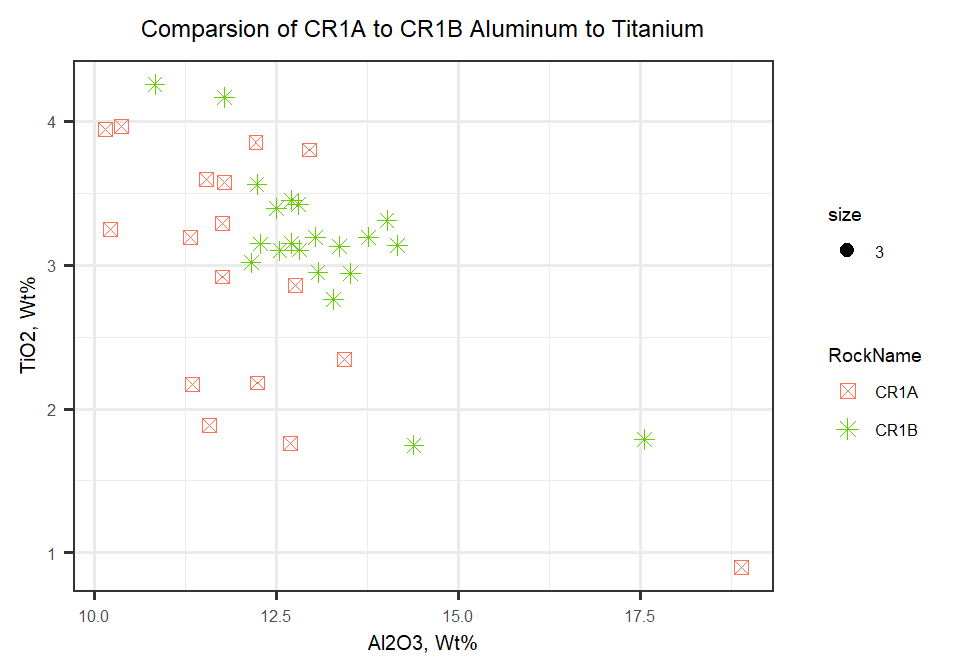
|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **wt %** | **CR1A2\_2 Pt1** | **CR1B\_1 Pt15** | **CR2A2\_3 PT1** | **CR2B2\_1 PT2** | **CR31\_3 PT7** | **CR42\_1 PT6** | **CR51\_2 PT5** | **CR72\_3 Pt1** |
| SiO2 | 64.5 | 60.4 | 59.2 | 59.7 | 71.9 | 69 | 66.2 | 69.6 |
| TiO2 | 3.57 | 3.15 | 2.87 | 2.84 | 0.43 | 0.473 | 2 | 0.26 |
| Al2O3 | 11.8 | 12.7 | 12.8 | 13.8 | 15.8 | 17.6 | 14.2 | 16.7 |
| Cr2O3 | 0.0336 | 0.0312 | 0 | 0 | 0 | 0.0078 | 0.0106 | 0.037 |
| MgO | 0.901 | 1.29 | 1.86 | 1.7 | 0.0119 | 0.0313 | 0.254 | 0.0002 |
| CaO | 2.57 | 4.12 | 4.71 | 4.26 | 2.03 | 3.73 | 3.57 | 1.21 |
| MnO | 0.154 | 0.125 | 0.117 | 0.151 | 0 | 0.0008 | 0.0356 | 0.003 |
| FeO | 9.36 | 10.8 | 10 | 10.2 | 0.741 | 0.954 | 3.8 | 0.503 |
| Na2O | 2.22 | 3.02 | 3.23 | 3.86 | 4.66 | 3.35 | 2.42 | 4.7 |
| K2O | 4.19 | 3.15 | 3.17 | 2.41 | 4.99 | 4.38 | 5.71 | 6.94 |
| S | 0 | 0.0067 | 0.0116 | 0.0021 | 0.0109 | 0.0207 | 0.0068 | 0.0163 |
| P2O5 | 1.13 | 0.889 | 0.663 | 0.735 | 0.118 | 0.0725 | 1.77 | 0.0859 |
| Total | 100 | 99.6 | 98.7 | 99.7 | 101 | 99.6 | 100 | 100 |

Taking a look at comparing CR1A to CR1B (two samples from the same flow)









Taking a look at comparing CR2A to CR2B

