

# S9\_Isobar\_Comparison\_Plotter

March 19, 2021

```
[1]: import sys
      sys.path.append('../..')

      import VESICAL as v
      import pandas as pd
```

```
[2]: alkbasalt = v.Sample({'SiO2': 49.0,
                          'TiO2': 1.27,
                          'Al2O3': 19.7,
                          'Fe2O3': 3.74,
                          'FeO': 5.33,
                          'MnO': 0.17,
                          'MgO': 4.82,
                          'CaO': 8.85,
                          'Na2O': 4.23,
                          'K2O': 1.00,
                          'P2O5': 0.37,
                          'H2O': 4.51,
                          'CO2': 0.25})

      rhyolite = v.Sample({'SiO2': 77.19,
                          'TiO2': 0.06,
                          'Al2O3': 12.80,
                          'FeO': 0.94,
                          'MgO': 0.03,
                          'CaO': 0.53,
                          'Na2O': 3.98,
                          'K2O': 4.65,
                          'CO2': 0.05,
                          'H2O': 0.26})

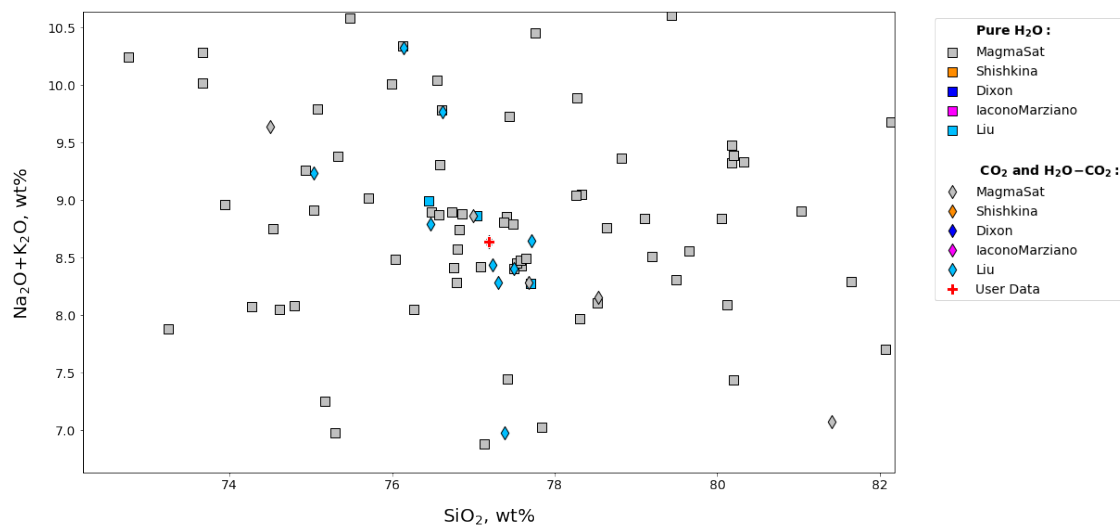
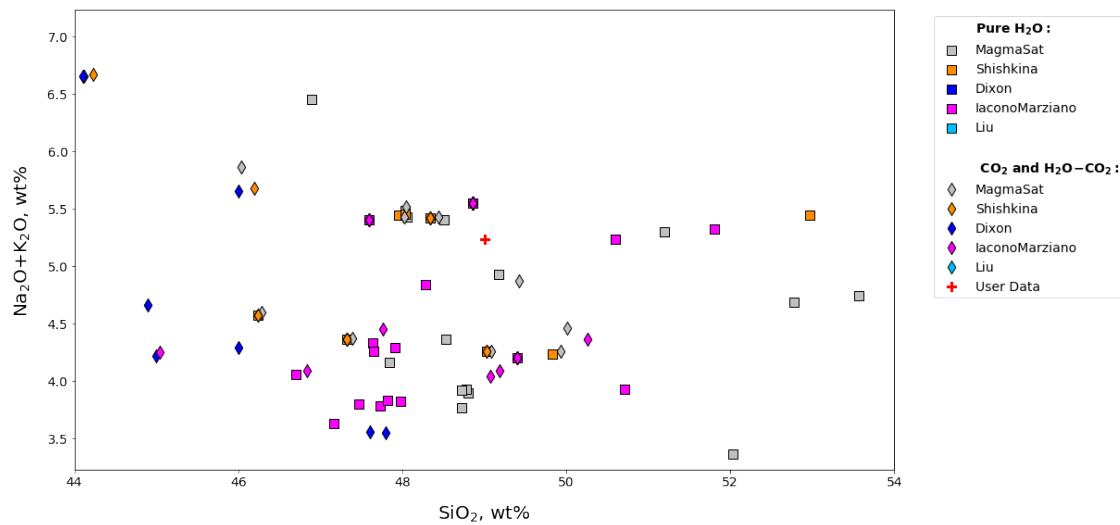
      sample_table = pd.DataFrame([alkbasalt.get_composition(), rhyolite.
      ↪get_composition()], index=["Alkali Basalt", "Rhyolite"])
      sample_table
```

```
[2]:           SiO2  TiO2  Al2O3  Fe2O3  FeO  MnO  MgO  CaO  Na2O  K2O  \
Alkali Basalt  49.00  1.27   19.7   3.74  5.33  0.17  4.82  8.85  4.23  1.00
```

Rhyolite	77.19	0.06	12.8	NaN	0.94	NaN	0.03	0.53	3.98	4.65
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	P205	H2O	CO2
Alkali Basalt	0.37	4.51	0.25
Rhyolite	NaN	0.26	0.05

```
[4]: #check calibration
v.calib_plot(user_data=alkbasalt.get_composition(), model='mixed',
             zoom='user_data')
v.calib_plot(user_data=rhyolite.get_composition(), model='mixed',
             zoom='user_data')
```



```
[5]: alkbasalt_isobars, alkbasalt_isopleths = v.
      ↪calculate_isobars_and_isopleths(sample=alkbasalt, temperature=1200,
      ↪pressure_list=[500, 1000, 2000], isopleth_list=[0.5], print_status=True).
      ↪result

      rhyolite_isobars, rhyolite_isopleths = v.
      ↪calculate_isobars_and_isopleths(sample=rhyolite, temperature=800,
      ↪pressure_list=[500, 1000, 2000], isopleth_list=[0.5]).result
```

```
Calculating isobar at 500 bars
done.
Calculating isobar at 1000 bars
done.
Calculating isobar at 2000 bars
done.
Done!
Calculating isobar at 500 bars
done.
Calculating isobar at 1000 bars
done.
Calculating isobar at 2000 bars
done.
Done!
```

```
[7]: Iac_alkbasalt_isobars, Iac_alkbasalt_isopleths = v.
      ↪calculate_isobars_and_isopleths(sample=alkbasalt, temperature=1200,
      ↪pressure_list=[500, 1000, 2000], isopleth_list=[0.5],
      ↪model="IaconoMarziano").result

      Dixon_alkbasalt_isobars, Dixon_alkbasalt_isopleths = v.
      ↪calculate_isobars_and_isopleths(sample=alkbasalt, temperature=1200,
      ↪pressure_list=[500, 1000, 2000], isopleth_list=[0.5], model="Dixon").result

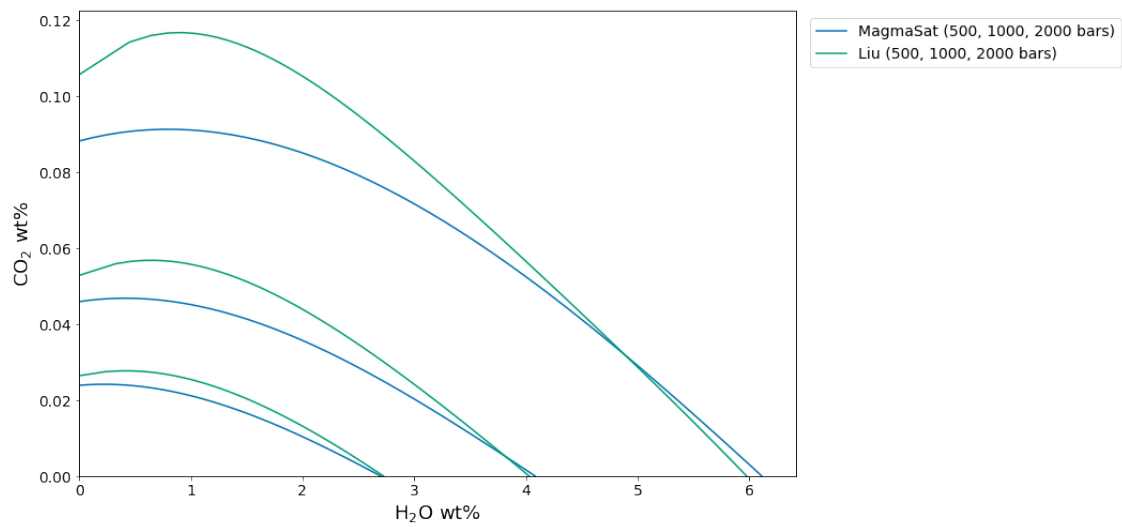
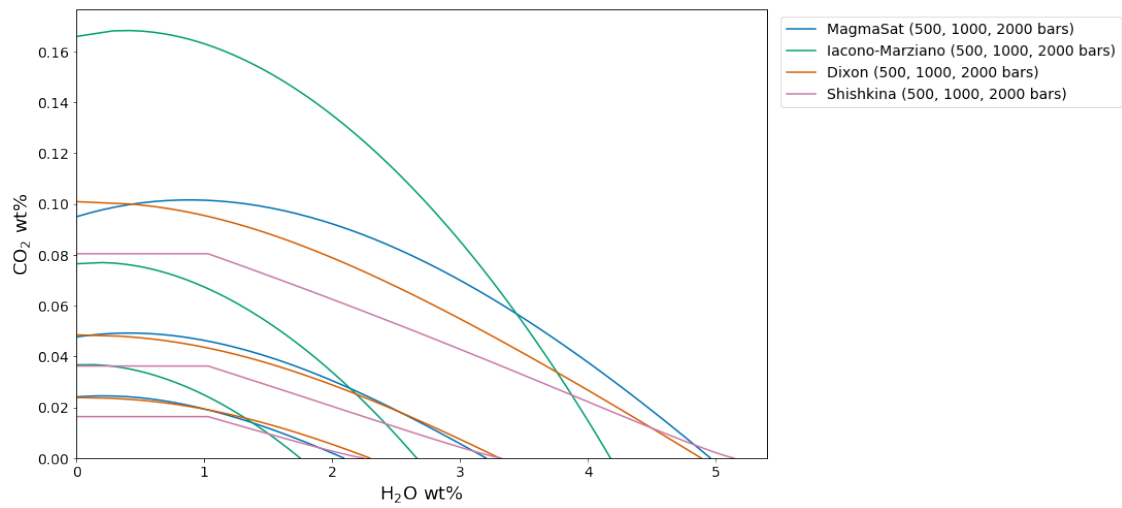
      Shish_alkbasalt_isobars, Shish_alkbasalt_isopleths = v.
      ↪calculate_isobars_and_isopleths(sample=alkbasalt, temperature=1200,
      ↪pressure_list=[500, 1000, 2000], isopleth_list=[0.5],
      ↪model="ShishkinaIdealMixing").result

      Liu_rhyolite_isobars, Liu_rhyolite_isopleths = v.
      ↪calculate_isobars_and_isopleths(sample=rhyolite, temperature=800,
      ↪pressure_list=[500, 1000, 2000], isopleth_list=[0.5], model="Liu").result
```

```
[8]: fig, ax = v.plot(isobars=[alkbasalt_isobars, Iac_alkbasalt_isobars,
      ↪Dixon_alkbasalt_isobars, Shish_alkbasalt_isobars],
      ↪isobar_labels=["MagmaSat", "Iacono-Marziano", "Dixon", "Shishkina"])
      v.show()

      fig, ax = v.plot(isobars=[rhyolite_isobars, Liu_rhyolite_isobars],
      ↪isobar_labels=["MagmaSat", "Liu"])
```

```
v.show()
```



```
[9]: fig, ax = v.plot(isobars=Shish_alkbasalt_isobars)
v.show()
```

