Garnet-Hornblende-Plagioclase

Notes
This program implements the models in Dale, Holland & Powell (CMP 140, 353-362, 2000) for calculating temperatures from the garnet-hornblende thermometer and average pressures (avP) using 3 barometers (tr-ts, tr-pa, tr-gl). It requires hornblende compositions entered in full together with garnet parameters

A) The first line lists the oxides known to the program. This line must consist of oxide names and spaces only (no tabs). See example below.

B) Then follow pairs of lines: each entry needs 2 lines:

1) Title

2) oxide wt% to match list at top of file, followed by XMg, XCa, XFe in garnet and then Xab in plag

C) Finally the star in place of another title tells the program to end.

This file is a text-only file.

A note on errors:
As in the paper (Dale, Holland & Powell CMP 140, 353-362, 2000) the errors in cations are assumed to be 0.015c + 0.005. For Fe3+ the error is assumed to be 25% of the calculated ferric iron (and this calculated error is also assumed to apply to ferrous iron). In addition the garnet and plagioclase mole fraction errors are taken into account, and are assumed to be 0.025x + 0.005. Uncertainties on Gibbs energy of the 4 reactions are taken from Dale et al (R1: 2.2 kJ, R2: 1.0 kJ, R3: 1.1 kJ, R4: 1.7 kJ).

Example file input

```
SiO2 TiO2 Al2O3 Cr2O3 Fe2O3 FeO MnO MgO CaO Na2O K2O
hoschek 2473
42.33  0.37 19.23 0.00 0.00 17.68 0.02 7.09 11.25 1.51 0.52          0.089  0.213  0.689  0.500
hoschek 2468
42.00  0.37 19.09 0.00 0.00 17.82 0.06 7.48 11.21 1.51 0.46          0.095  0.208  0.674  0.440
BINNS H1
44.75 1.77  9.76 0.00 0.00 18.80 0.32 9.42 11.16 1.44 0.42          0.036  0.244  0.647  0.65
BINNS H26
42.25 1.79 11.47 0.00 0.00 22.13 0.19 6.08 11.73 1.29 1.00          0.062  0.234  0.574  0.19
KOHN CD301G
42.44 0.42 19.74 0.00 0.00 13.99 0.30 8.94 10.66 2.10 0.35          0.168  0.133  0.624  0.65
KOHN 7149H
42.20 0.30 17.61 0.00 0.00 17.37 0.29 7.01 11.05 1.25 0.29          0.096  0.131  0.695  0.40
*
```