

## Phase diagram movies

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The movies below were originally published by Powell *et al.* (1998) and the two Worley & Powell (1998) papers. The Mathematica code was written by rp, but Brenton Worley (bw) did all the tedious calculating and assembly. The code, with some examples, is given under the Mathematica documentation. As Quicktime movies, they can also be played by going into the “movies” folder and double-clicking on them.

- AFM compatibility diagram movie at 6 kbar
- AFM compatibility diagram movie at 3 kbar
- KFMASH  $T$ - $x_{\text{Fe}}$  pseudosection movie at 600°C, corresponding to the composition line used in Fig. 4 of Powell *et al.* (1998)





NCKFMASH compatibility diagram movies from the singularities paper.

- Fig 10: NCFM + plag + bi + mu + q + H<sub>2</sub>O compatibility diagram at P = 5.5 kbar. The movie is animated with respect to temperature, over the range 555 to 560°C.
- Fig 12: NCFM + plag + bi + mu + q + H<sub>2</sub>O compatibility diagram at P = 5.5 kbar for the temperature range 586 to 591°C. The singular, chl = pa + g (586.93°C); NCKFMASH, g + chl = pa (588.5°C) and full-system, g + ma + chl = st (590.6°C) reactions are illustrated.
- Fig 14a: NCFM + plag + bi + mu + q + H<sub>2</sub>O compatibility diagram movie over the temperature range 596 to 601°C at P = 5.5 kbar. The full system univariant reactions; st + chl = ma + pa (596.9°C), st + ma + pa = ky (598.0°C) and ma + pa = ky + chl (598.05°C) are shown. Following this last reaction, the kyanite one phase field expands rapidly as the ky + ma + chl and ky + pa + chl divariants sweep across the diagram to more magnesium compositions.
- Fig 14b: A movie of only the central portion of the NCFM compatibility diagram for the temperature interval 590 to 600°C. This movie illustrates all of the full-system staurolite- and kyanite-bearing univariant reactions.
- Fig 15: NCFM + plag + bi + mu + q + H<sub>2</sub>O compatibility diagrams calculated over the temperature range 605 to 610°C, at P = 5:5 kbar, illustrating how the of the two g + st + ma divariant assemblages come together with increasing temperature and finally disappear, between (b) and (c), at the singular reaction, g + ma = st, at 607.6°C. The st + g + pa divariant assemblage is also removed at 607.6°C, between (b) and (c), by the NCKFMASH reaction, g + pa = st.
- Fig 16: NCFM + plag + bi + mu + q + H<sub>2</sub>O compatibility diagram movie over the temperature range 605 to 610°C at P = 5:5 kbar. This movie illustrates the progressive convergence of the high-CaO and low-CaO st + g + ma divariant assemblages at T approaches the singular reaction g + ma = st, at 607.6°C. The two ky + st + ma divariants then also start to come together and will disappear at 612.4°C completely removing margarite from the NCKFMASH system at this pressure.
- Fig 17: NCFM + plag + bi + mu + q + H<sub>2</sub>O compatibility diagram movie over the temperature range 550 to 670°C at P = 5:5 kbar, summarising the phase diagrams presented in Figs. 8 to 16.





