Mantle Melting Modelling

Batch:

$$C_L = \frac{C_0}{D_0 + F(1-P)}$$

Fractional:

$$\bar{C_L} = \frac{C_0}{F}\left[1 - \left(1 - \frac{PF}{D_0}\right)^{\frac{1}{P}}\right]$$

- X_i: Proportion of mineral i in unmelted bulk solid.
- D_i: Partition coefficient of phase/mineral i.
- D_0: Bulk partition coefficient of the solid, $D_0 = \sum X_i D_i$.
- F: Melt fraction.
- C_L: Composition in final liquid.
- C_0: Composition in initial solid.
- p_i: Melting proportion for a given phase/mineral.
- P: Bulk reaction coefficient, $P = \sum p_i D_i$ (sometimes called A).