i) In the isothermal sum rates method for Liquid-Liquid Extraction, the teas variable is the Extract flow rate (V_j). This variable is related to other parameters in the algorithm through the sum rates relation, where the total Extract flow rate is the sum of the mole fractions of the Extract in each stage multiplied by the corresponding stage flow rate.

Sum rates rel^n $\Rightarrow V_j^{k+1} = V_j^k \sum_{i=1} y_{i,j}$ $k \rightarrow$ outer loop index

ii) Teas variable is initialised by assuming a perfect seperation for feed components and neglecting solvent mass transfer to the raffinate phase. This provides approximate values for the existing raffinate and extract flows.

iii) The teas variable V_j is updated iteratively in the algorithm. After an initial set is obtained, intermediate V_j values are obtained by linear interpolation. The rationale behind ~~iterative~~ ~~by~~ updating the teas variable is to iteratively improve the ~~#~~ seperation efficiency of the liq-liq extraction process ensuring that the computed values of V_j lead to a balanced extraction process.

iv) The ~~essor~~ criterion for convergence with the teas variable is typically based on the difference between the current and previous values of the teas variable. Normalis^n of the teas variable may be required to ensure that the algorithm converges properly. Normalization helps maintain consistency in the calculations and prevents large changes in the teas variable that could lead to convergence issues.

$$\rightarrow T_2 = \sum_{j=1}^{N} \left(\frac{V_j(K) - V_j(K-1)}{V_j(K)} \right)^2 \leq \epsilon_2$$

v) Mole fraction normalization in the algorithm involves using normalized values of the mole fractions of the components in the liquid phases ($x_{i,j}$ and $y_{i,j}$). This normalizn is to ensure that computed values of the partition ratios ($K_{i,j}$) are consistent with the mass balances and ~~other~~ other calculations in the algorithm. It helps to maintain accuracy and stability in the calcul^{n}s.

$$x_{i,j} = \frac{x_{i,j}}{\sum x_{i,j}}$$