Data File Read and verify the data file and store the Gibbs energy coefficient of **Parsing** different species Temperature Read the parameters - temperature, pressure and composition Pressure Input Composition Use a linear approximation to find initial assemblage Initialisation using levelling method Find the stable phases by Gibbs Energy minimising the Gibbs energy of the non-linear system **Minimisation** Use non-convex optimisation to find Global the global minimum for complex systems **Optimisation** Assemblage Pass the output such as chemical potential, Gibbs energy, etc. Chem Potenial **Output**