Week Eight

Siva Sundar, EE23B151

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Solving nuclear chain reactions using open petri-nets

Made a **jupyter notebook** which implements open petri-nets to solve a particular nuclear chain reaction: the **"alpha process"** (See ref.[1]). It contains 11 Helium addition reactions and 4 decay chains. I could only get accurate rate constants for the decay reactions. The working of the code is explained in the notebook.

Using PLUTO

Tried running the jupyter file in PLUTO. Created a **PLUTO notebook** implementing the same code and a `.pdf` file using PLUTO.

Outputs

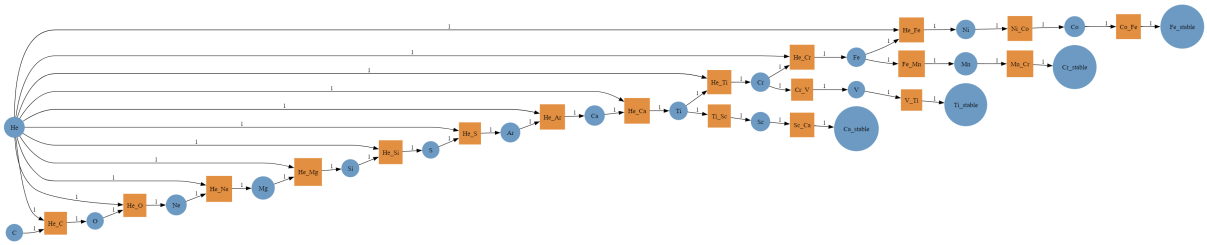

Figure 1: **Alpha process** expressed in terms of **open petri-nets**

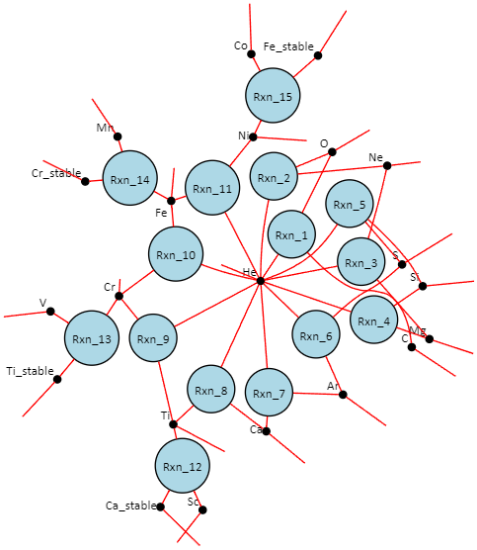

Figure 2: UWD diagram for **Alpha process**

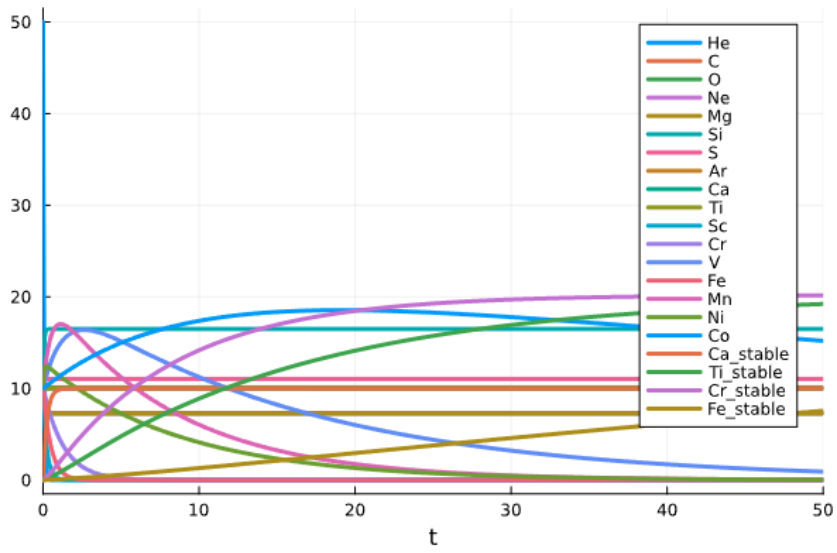

Figure 3: Solution for the given initial conditions and parameter values

References

[1] Wikipedia: Isotope (The last table provides details of every element's isotopes)

[2] Wikipedia: Alpha Process

[3] Navin's UWD implementation notebook