

Using Cyclus for Online Diversion Detection of Shadow Fuel Cycles

Gregory T. Westphal, Kathryn D. Huff

University of Illinois at Urbana-Champaign, Department of Nuclear, Plasma, and Radiological Engineering, Urbana, IL 61801

Objectives

- Timely detection of diversion relies on the identification of signatures and observables for unique facilities.
- Create high-fidelity diversion algorithms.
- Determine optimum detector and inspection locations in pyroprocessing facilities using the Cyclus framework.
- Adapt this work to be applicable to a wide range of nuclear fuel cycle facilities in cyclis
- Characterize required detection sensitivities and corresponding false positive rates.

Background

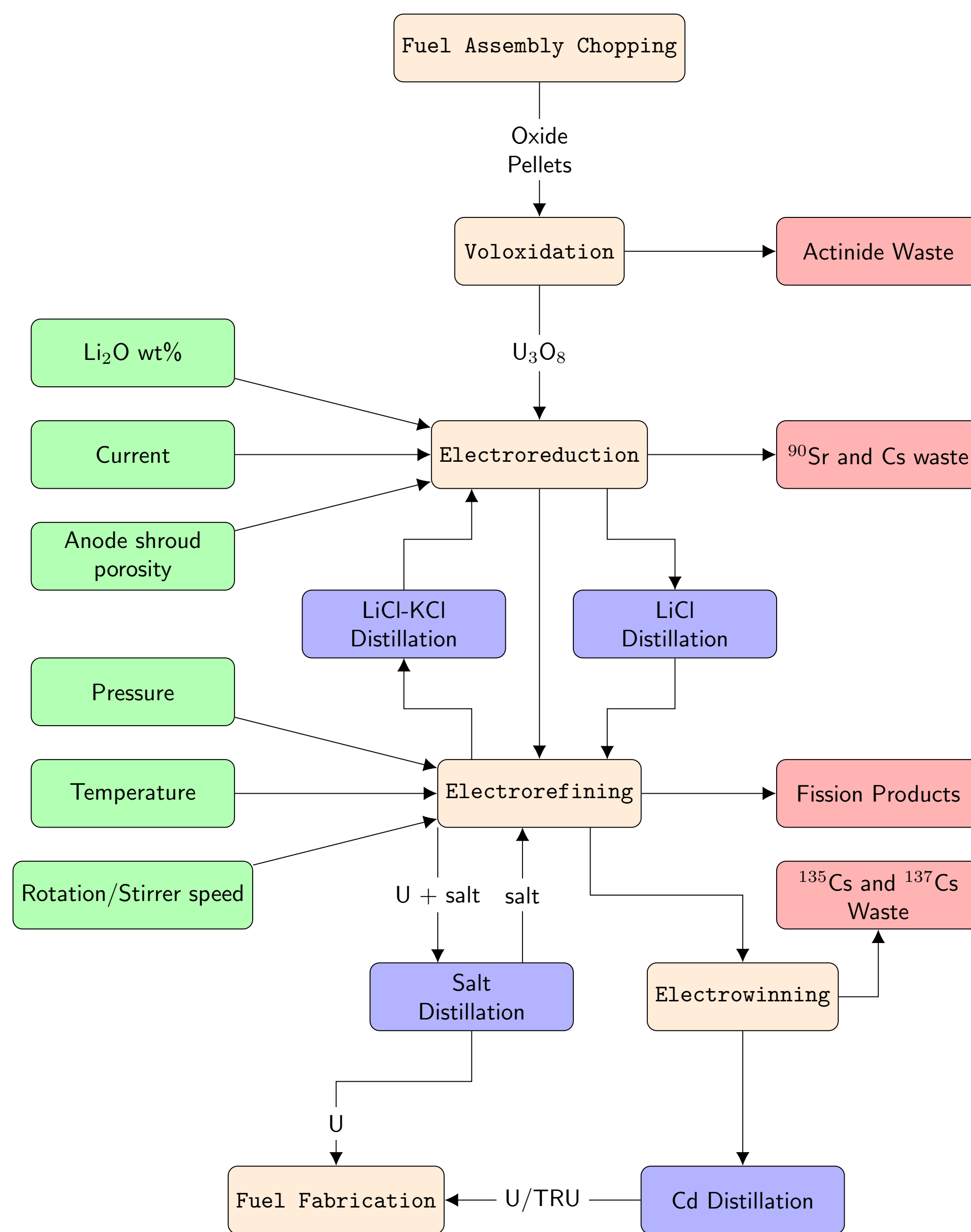


Figure: Archetype design of the Pyre facility [1].

Facility Simulation

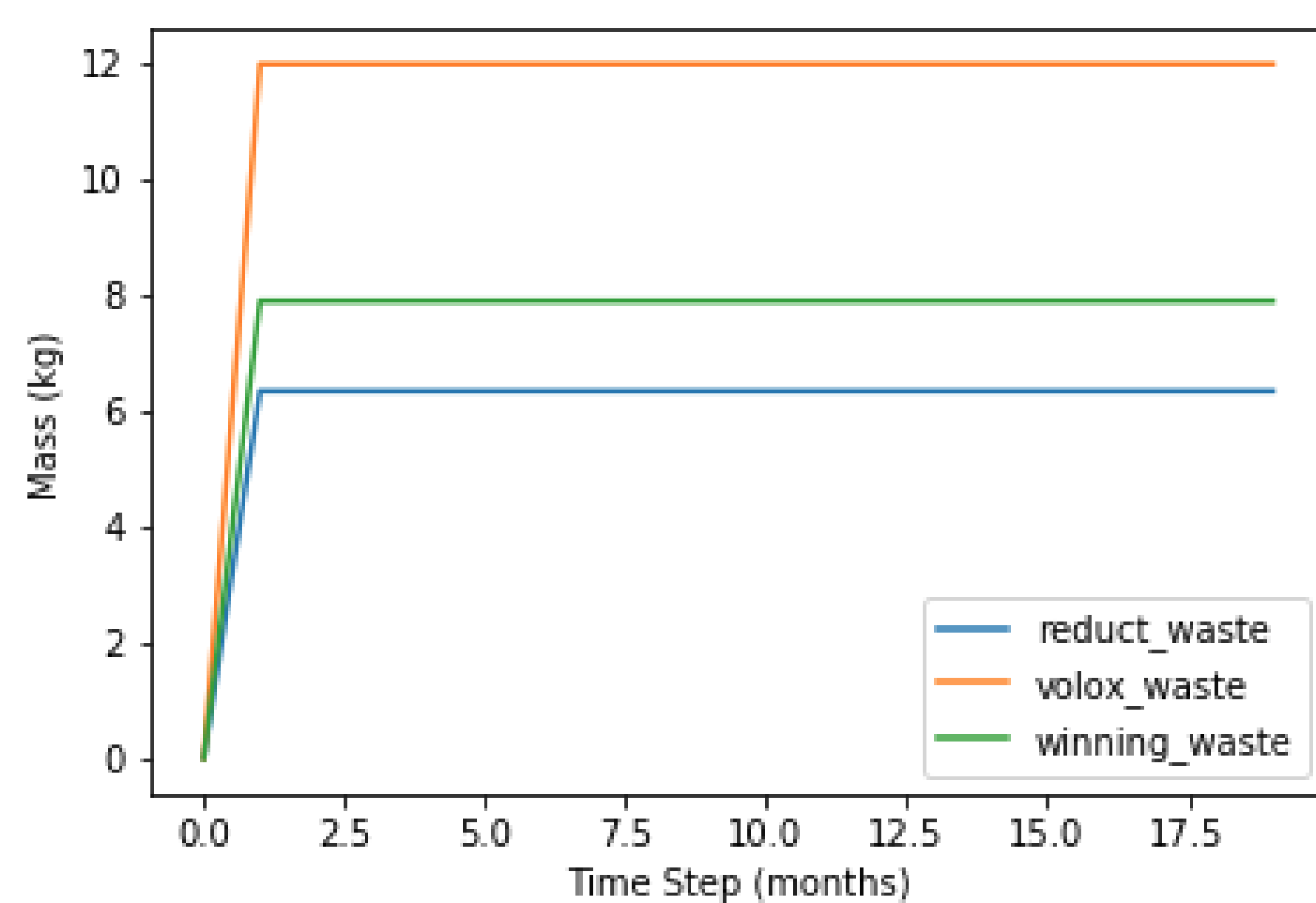


Figure: Example material transactions every time step.

