1048-11-373 **Dustin Reishus*** (reishus@usc.edu), Department of Computer Science, 941 W. 37th Place, Los Angeles, CA 90089-0781. *Number Theory in Chemical Reaction Networks.* Preliminary report.

The atomic hypothesis, that all substances are composed of a unique set of atoms, is central to chemistry. Similarly, the fundamental theorem of arithmetic, that all natural numbers are composed of a unique set of primes, is central to number theory. The law of mass action describes how substances and the atoms they contain interact through time. We hope to use this law to describe how numbers and the primes that compose them interact through time. In particular, we wish to start with the primes and "watch" through time as they combine via multiplication to generate all of the natural numbers. We will consider thermodynamic properties such as temperature, pressure, energy, and entropy in such systems. (Received February 10, 2009)