



(Wikipedia 2010)

The Miller-Urey experiment was an experiment that simulated hypothetical conditions thought at the time to be present on the early Earth, and tested for the occurrence of chemical evolution. Specifically, the experiment tested Alexander Oparin's and J. B. S. Haldane's hypothesis that conditions on the primitive Earth favored chemical reactions that synthesized organic compounds from inorganic precursors. Considered to be the classic experiment on the origin of life, it was conducted in 1952 and published in 1953 by Stanley Miller and Harold Urey.

The experiment used water (H2O), methane (CH4), ammonia (NH3), and hydrogen (H2). The chemicals were all sealed inside a sterile array of glass tubes and flasks connected in a loop, with one flask half-full of liquid water and another flask containing a pair of electrodes. The liquid water was heated to induce evaporation, sparks were fired between the electrodes to simulate lightning through the atmosphere and water vapor, and then the atmosphere was cooled again so that the water could condense and trickle back into the first flask in a continuous cycle.

At the end of one week of continuous operation, Miller and Urey observed that as much as 10-15% of the carbon within the system was now in the form of organic compounds. Two percent of the carbon had formed amino acids that are used to make proteins in living cells, with glycine as the most abundant. Sugars, lipids, and some of the building blocks for nucleic acids were also formed.

In an interview, Stanley Miller stated: "Just turning on the spark in a basic pre-biotic experiment will yield 11 out of 20 amino acids."

Diatoms are a major group of eukaryotic algae, and are one of the most common types of phytoplankton. Most diatoms are unicellular, although they can exist as colonies in the shape of filaments or ribbons (e.g. Fragillaria), fans (e.g. Meridion), zigzags (e.g. Tabellaria), or stellate colonies (e.g. Asterionella). Diatoms are producers within the food chain. A characteristic feature of diatom cells is that they are encased within a unique cell wall made of silica (hydrated silicon dioxide) called a frustule. These frustules show a wide diversity in form, but usually consist of two asymmetrical sides with a split between them, hence the group name. Fossil evidence suggests that they originated during, or before, the early Jurassic Period. Diatom communities are a popular tool for monitoring environmental conditions, past and present, and are commonly used in studies of water quality (Wikipedia 2010).