

# A Simulation of Pluto's Tholin Creation in Its Intermittent Atmosphere Due to Its Elliptical Orbit

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Due to the New Horizons mission, a lot of questions have risen about Pluto. This project aimed to simulate the process of elements condensing back onto its surface as it revolves away from the Sun, with a focus on how it produces biological molecules. The hypothesis was that when liquid nitrogen is introduced, the water in the chamber will freeze onto the copper plate, reducing the pressure of the chamber. Background research was performed on Pluto and all other topics involved with this project to provide background knowledge. Following that, the full list of materials was obtained to perform the experiment. After that, several KF-50 flanges were removed and replaced with adapters for a pressure reader, vacuum pump, and an injection site along with their appropriate gaskets and clamps for the purposes of configuring the chamber for the project. A copper piece was then fitted as well. After that, the hose of the vacuum pump was attached to the adapter. A test run for pulling vacuum was then performed, and several issues were identified and fixed. Following that, the experiment was conducted. The data from the experiment was then analyzed, and turned into tables and graphs. The hypothesis for this project was accepted. In each of the trials the chamber pressure dropped to almost zero Torr after the liquid nitrogen was poured. This proves the water froze to the copper plate, as water has a very specific pressure, and that pressure was lost when it turned into ice.