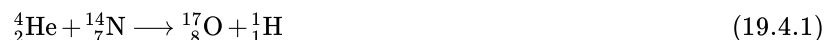


## 19.4: Artificially Induced Nuclear Reactions

---

In 1919 Rutherford performed the first artificial nuclear reaction. He was able to demonstrate that when  $\alpha$  particles are introduced into a closed sample of  $\text{N}_2$  gas, an occasional collision led to the formation of an isotope of O and the release of a proton:



Since then many thousands of nuclear reactions have been studied, most of them produced by the bombardment of stable forms of matter with a beam of nucleons or light nuclei as projectiles. Particles which have been used for this purpose include protons, neutrons, deuterons ( ${}_1^2\text{H}$ ),  $\alpha$  particles, and B, C, N, and O nuclei.

---

This page titled [19.4: Artificially Induced Nuclear Reactions](#) is shared under a [CC BY-NC-SA 4.0](#) license and was authored, remixed, and/or curated by [Ed Vitz](#), [John W. Moore](#), [Justin Shorb](#), [Xavier Prat-Resina](#), [Tim Wendorff](#), & [Adam Hahn](#).