

Nitrogen

Nitrogen is the [chemical element](#) with the [symbol](#) **N** and [atomic number](#) 7. It was first discovered and isolated by Scottish physician [Daniel Rutherford](#) in 1772. Although [Carl Wilhelm Scheele](#) and [Henry Cavendish](#) had independently done so at about the same time, Rutherford is generally accorded the credit because his work was published first. The name *nitrogène* was suggested by French chemist [Jean-Antoine-Claude Chaptal](#) in 1790 when it was found that nitrogen was present in [nitric acid](#) and [nitrates](#). [Antoine Lavoisier](#) suggested instead the name *azote*, from the Greek ἀζωτικός "no life", as it is an [asphyxiant gas](#); this name is instead used in many languages, such as [French](#), [Italian](#), [Russian](#), [Romanian](#) and [Turkish](#), and appears in the English names of some nitrogen compounds such as [hydrazine](#), [azides](#) and [azo compounds](#).

Nitrogen is the lightest member of [group 15](#) of the periodic table, often called the pnictogens. It is a common element in the [universe](#), estimated at about [seventh in total abundance](#) in the [Milky Way](#) and the [Solar System](#). At [standard temperature and pressure](#), two atoms of the element [bind](#) to form dinitrogen, a colourless and odorless [diatomic gas](#) with the formula N₂. Dinitrogen forms about 78% of [Earth's atmosphere](#), making it the most abundant uncombined element. Nitrogen occurs in all organisms, primarily in [amino acids](#) (and thus [proteins](#)), in the [nucleic acids](#) ([DNA](#) and [RNA](#)) and in the energy transfer molecule [adenosine triphosphate](#). The [human body contains](#) about 3% nitrogen by mass, the fourth most abundant element in the body after oxygen, carbon, and hydrogen. The [nitrogen cycle](#) describes movement of the element from the air, into the [biosphere](#) and organic compounds, then back into the atmosphere.

Many industrially important compounds, such as [ammonia](#), nitric acid, organic nitrates ([propellants](#) and [explosives](#)), and [cyanides](#), contain nitrogen. The extremely strong [triple bond](#) in elemental nitrogen (N≡N), the second strongest bond in any [diatomic molecule](#) after [carbon monoxide](#) (CO),^[2] dominates nitrogen chemistry. This causes difficulty for both organisms and industry in converting N₂ into useful [compounds](#), but at the same time means that burning, exploding, or decomposing nitrogen compounds to form nitrogen gas releases large amounts of often useful energy. Synthetically produced ammonia and nitrates are key industrial [fertilisers](#), and fertiliser nitrates are key [pollutants](#) in the [eutrophication](#) of water systems.

Apart from its use in fertilisers and energy-stores, nitrogen is a constituent of organic compounds as diverse as [Kevlar](#) used in high-strength fabric and [cyanoacrylate](#) used in [superglue](#). Nitrogen is a constituent of every major pharmacological drug class, including [antibiotics](#). Many drugs are mimics or [prodrugs](#) of natural nitrogen-containing [signal molecules](#); for example, the organic nitrates [nitroglycerin](#) and [nitroprusside](#) control [blood pressure](#) by metabolizing into [nitric oxide](#). Many notable nitrogen-containing drugs, such as the natural [caffeine](#) and [morphine](#) or the synthetic [amphetamines](#), act on receptors of animal [neurotransmitters](#).