

## Oxidation states of nitrogen

<u>Ox. state</u>	<u>Species</u>	
+5	$\text{NO}_3^-$	Nitrate ion, oxidizing agent in acidic solution.
+4	$\text{NO}_2$	Nitrogen dioxide, a brown gas usually produced by the reaction of concentrated nitric acid with many metals. It dimerizes to form $\text{N}_2\text{O}_4$ .
+3	$\text{NO}_2^-$	Nitrite ion in basic solution and nitrous acid in acidic solution. Can be either an oxidizing agent to usually produce $\text{NO}(\text{g})$ or a reducing agent to form the nitrate ion.
+2	$\text{NO}$	Nitrogen oxide also called nitric oxide. A colorless gas produced by the reaction of metals with dilute nitric acid which then reacts with $\text{O}_2$ in the air to form the brown $\text{NO}_2$ gas.
+1	$\text{N}_2\text{O}$	Dinitrogen oxide also called nitrous oxide or laughing gas.
0	$\text{N}_2$	Commonly found in air and very unreactive because of the very strong triple bond.
-1	$\text{NH}_2\text{OH}$	Hydroxylamine, a weak base, which can act as either an oxidizing agent or reducing agent.
-2	$\text{N}_2\text{H}_4$	Hydrazine, a colorless liquid, is a weak base. Used as a rocket fuel. It disproportionates to $\text{N}_2$ and $\text{NH}_3$ .
-3	$\text{NH}_3$	In basic solution and as $\text{NH}_4^+$ in acidic solution. Not generally used as a reducing agent in aqueous solutions. When ammonia is burned in the presence of oxygen it is oxidized to either $\text{N}_2$ or $\text{NO}$ . The oxidation of ammonium salts usually produces nitrogen gas.