

Sources of Natural Hydrogen: An Overview

Degassing of Deep Hydrogen

Hydrogen forms deep underground through reactions breaking down water under high temperatures and pressures. It can migrate up, escaping into the atmosphere or gathering in geological traps.

Serpentinization

Natural hydrogen is mainly produced through serpentinization, a process where ultrabasic rocks like peridotites react with water. This occurs at mid-ocean ridges and releases hydrogen gas as a byproduct.

Water in Contact with ferrous iron

Deep underground, water reacts with reducing agents like ferrous iron in the mantle, producing hydrogen and highlighting the mantle's potential as a hydrogen source.



Weathering

The natural weathering process, wherein water interacts with newly exposed rock surfaces, can lead to the chemical release of hydrogen. This process is especially relevant in areas of active geological changes.

Decomposition of Hydroxyl Ions

Certain minerals contain hydroxyl ions (OH-) as part of their crystal structure. The breakdown of these minerals can lead to the release of hydrogen gas, contributing to the natural hydrogen flux.

Natural Water Radiolysis

Radiolysis in natural water bodies exposed to radioactive materials splits water molecules, releasing hydrogen gas as it decomposes through radiation.