

Finding Inorganic Elements in Living Tissue



Living organisms contain complex organic carbon compounds. To reveal the underlying inorganic elements, we must perform a destructive physical analysis.

Step 1: Establishing the Wet Weight



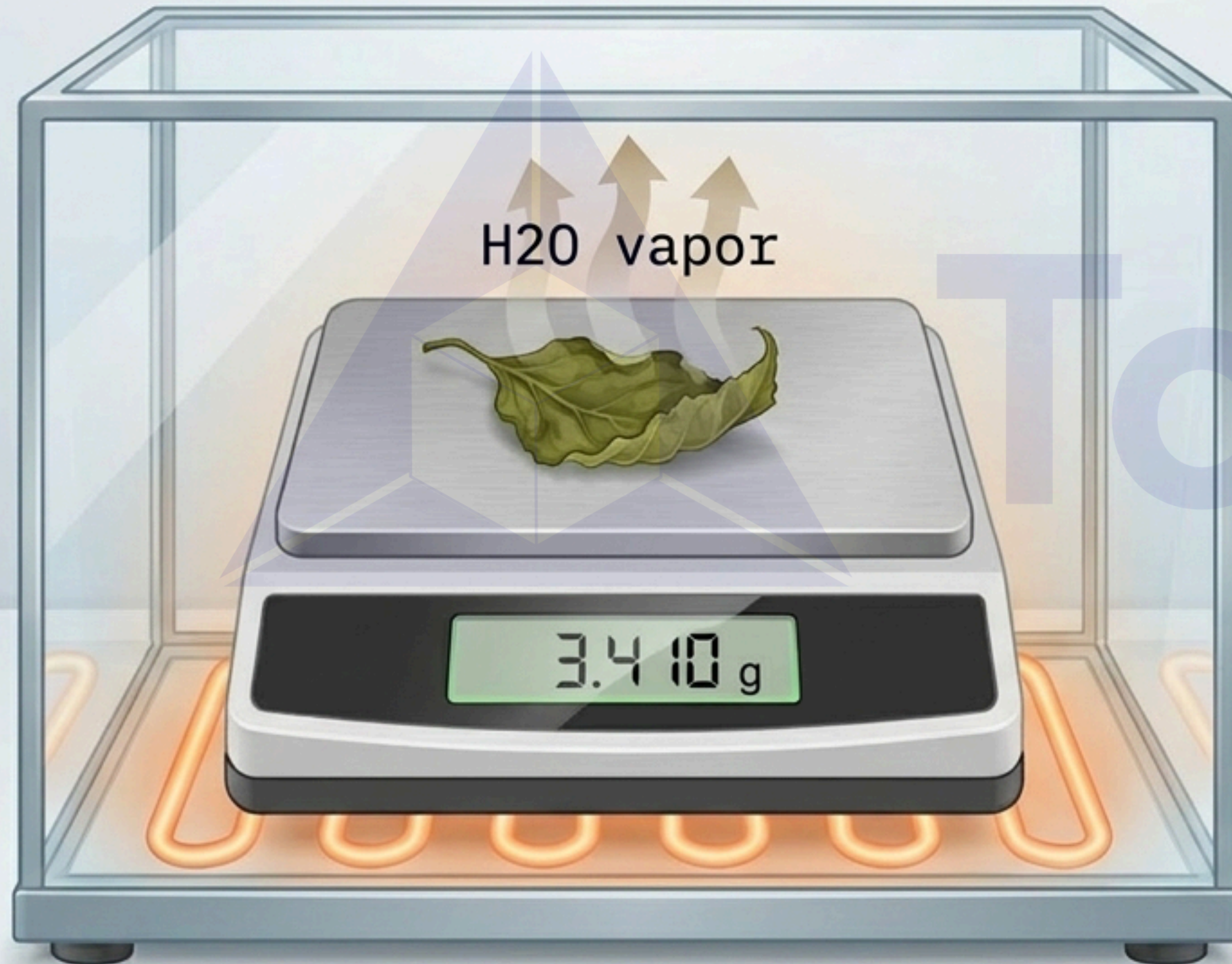
Wet Weight

The baseline state. A small amount of living tissue—such as a leaf or a piece of liver—is placed on a scale. This initial measurement includes all cellular structure, carbon compounds, and, crucially, a massive volume of intracellular water.

Step 2: Desiccation and Water Removal

Dry Weight

The tissue is heated to evaporate all water content. Because water is the most abundant chemical in living organisms, the remaining mass is significantly lighter.





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$$E=mc^2$$



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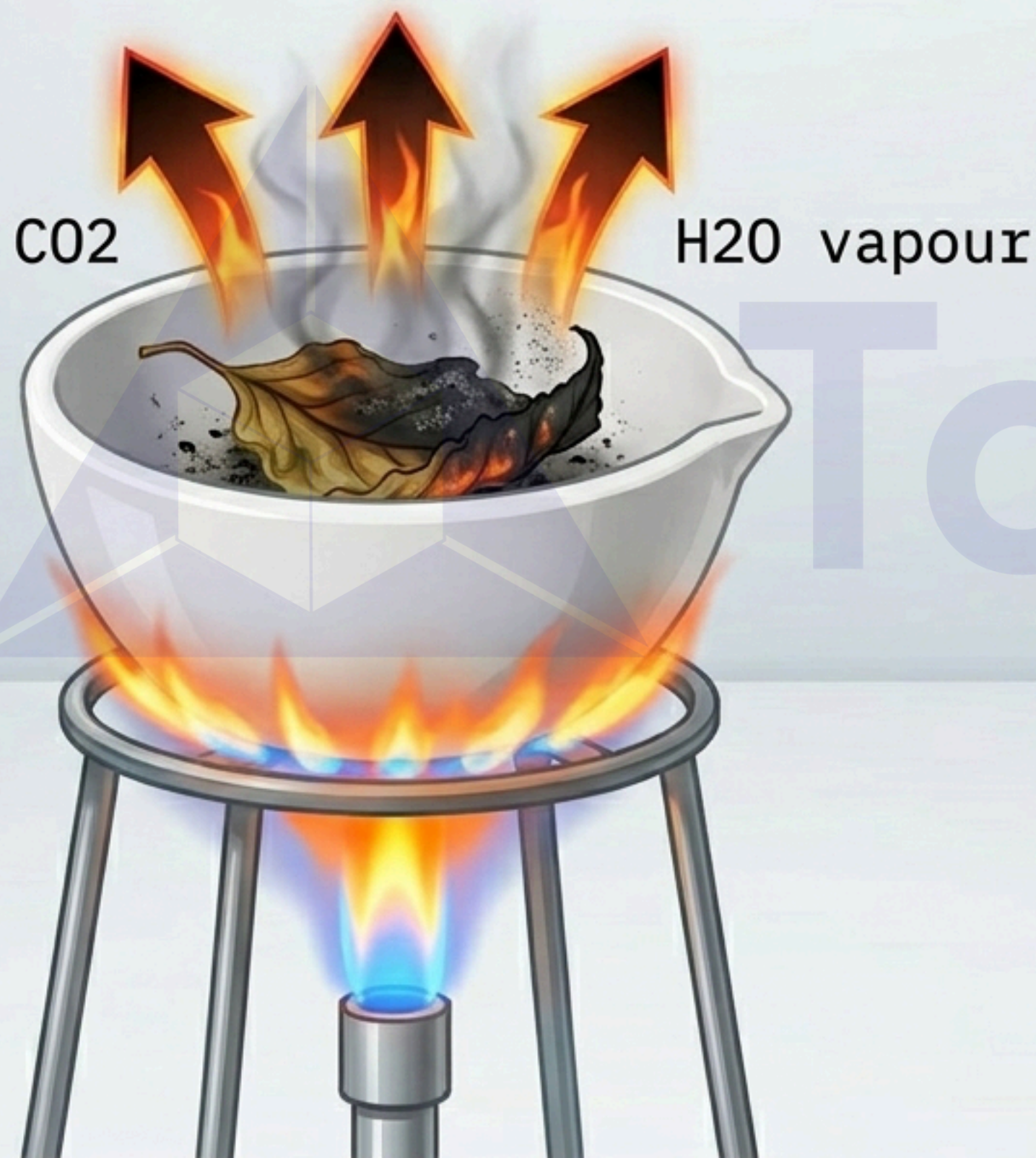
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Step 3: Combustion of Carbon Compounds



DESTRUCTIVE EXPERIMENT:

When the tissue is fully burnt, all organic carbon compounds are permanently oxidized into gaseous forms and removed from the sample.

The organic complexity has been vaporized. What remains is no longer biologically active.

The Reveal: What Survives the Fire

Ca^{++}

Mg^{++}

PO_4^{3-}

SO_4^{2-}

What remains after complete combustion is called “ash”. This material is entirely devoid of carbon.

The ash contains the raw inorganic elements and compounds that were embedded within the living tissue. These are the fundamental mineral building blocks of the organism.

The Biosphere vs. The Lithosphere

Earth's Crust (% Weight)		Human Body (% Weight)	
Hydrogen (H)	0.14	Hydrogen (H)	9.5
Carbon (C)	0.03	Carbon (C)	18.5
Oxygen (O)	46.6	Oxygen (O)	65.0
Nitrogen (N)	very little	Nitrogen (N)	3.3
Sulphur (S)	0.03	Sulphur (S)	0.3
Sodium (Na)	2.8	Sodium (Na)	0.2
Calcium (Ca)	3.6	Calcium (Ca)	1.5
Magnesium (Mg)	2.1	Magnesium (Mg)	0.1
Silicon (Si)	27.7	Silicon (Si)	negligible

While both lists share the same elemental ingredients, the relative abundance of Carbon and Hydrogen is vastly higher in living organisms than in non-living matter.

Cataloging Inorganic Constituents



These inorganic compounds and ions are found both in the destructive ash test and in the acid-soluble fraction of fresh tissue analysis.

The Analytical Synthesis



To understand the fundamental inorganic building blocks of life, we must first strip away the water and burn away the overwhelming organic complexity. The ash that remains proves that living organisms are built from the exact same elemental palette as the Earth's crust—simply arranged in vastly different proportions.



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