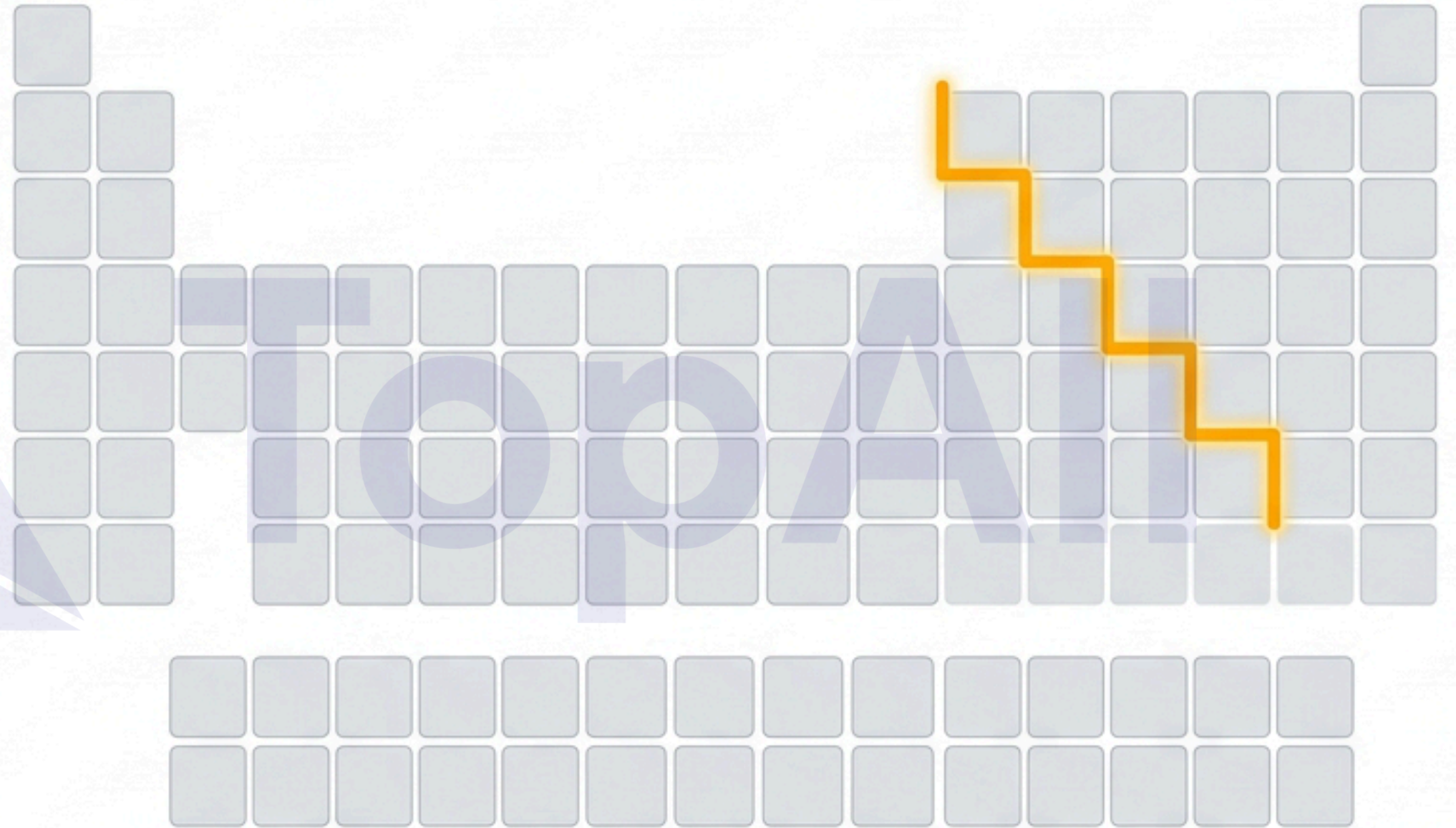


The Periodic Divide

Mapping the physical and chemical territories of Metals, Non-Metals, and the Borderlands.



The Dominant Territory: Metals



State & Structure

Solids at room temp. Comprise
>78% of all known elements.



Workability

Malleable (flattened into sheets)
& **Ductile** (drawn into wires).



Conductivity

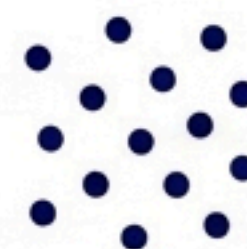
Excellent conductors of heat and electricity.

Anomalies: Hg (Liquid). Ga & Cs (Low melting points: 303K & 302K).

[illegible]

The Eastern Province: Non-Metals

A blank periodic table grid is shown, consisting of a large main body and a separate row at the bottom. The main body has 7 rows and 18 columns. The first two columns are on the left, and the last two columns are on the right, with a gap in the middle. The bottom row is a single row of 18 cells. A faint, light blue pyramid is visible in the background, centered behind the grid.



State

Solids or gases at room temperature. Generally low melting & boiling points.



Structure

Brittle solids. Neither malleable nor ductile.



Conductivity

Poor conductors of heat and electricity.

Anomalies: B (Boron) and C (Carbon) have uniquely high melting and boiling points.

The Borderlands: Metalloids

The change from metallic to non-metallic character is not abrupt. The thick zig-zag line marks a gradient zone.

These elements exhibit properties characteristic of both metals and non-metals.

Also known as “Semi-metals”.

					He	
	B	C	N	O	F	Ne
	Al	Si	P	S	Cl	Ar
Zn	Ga	Ge	As	Se	Br	Kr
Cd	In	Sn	Sb	Te	I	Xe
Hg	Tl	Pb	Bi	Po	At	Rn



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Elements of the Staircase



Silicon



Germanium



Arsenic

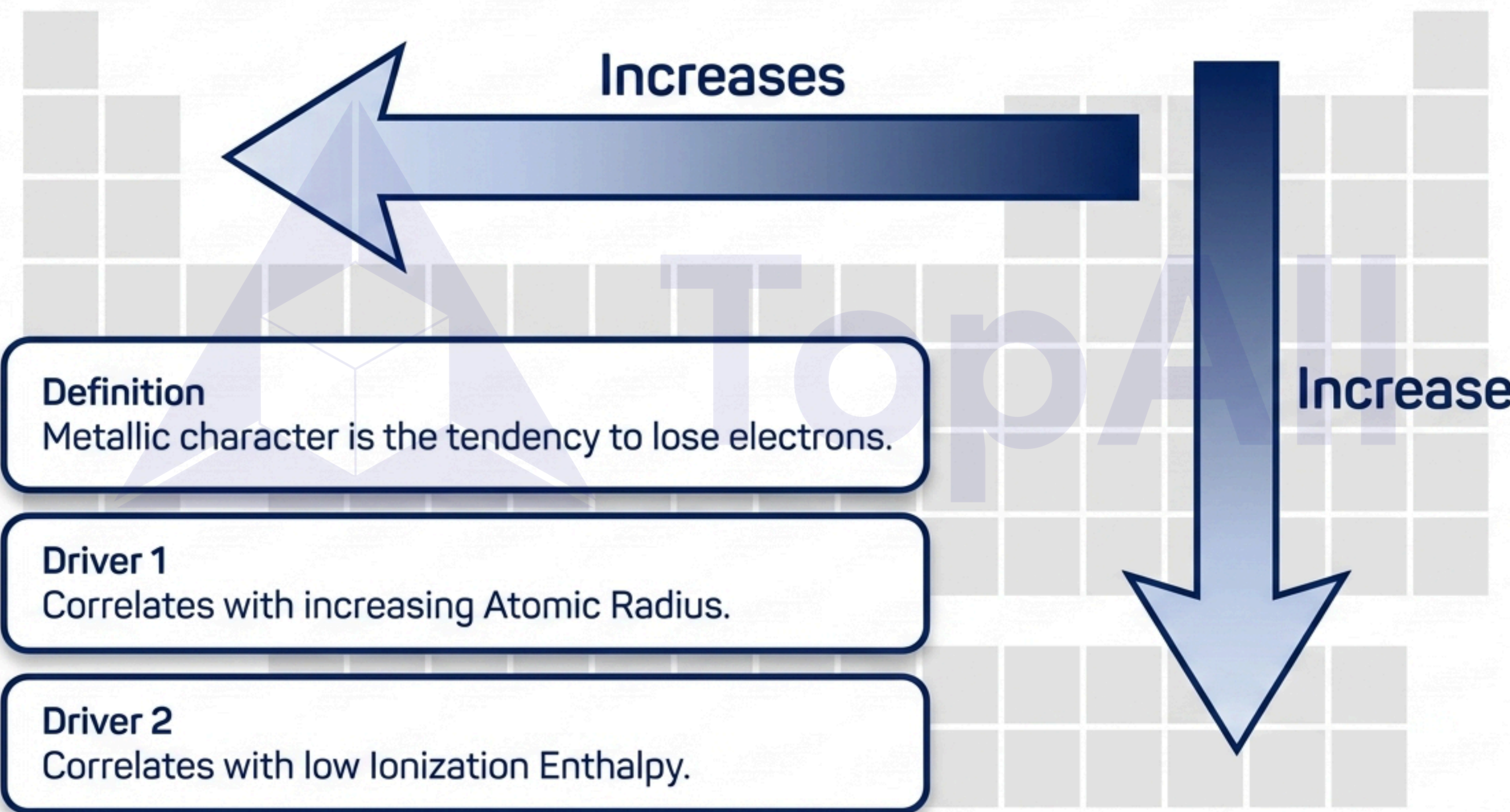


Antimony



Tellurium

The Trend of Metallic Character



Increases

Definition

Metallic character is the tendency to lose electrons.

Driver 1

Correlates with increasing Atomic Radius.

Driver 2

Correlates with low Ionization Enthalpy.

Increases

The Trend of Non-Metallic Character

Increases



Definition

Non-metallic character is the tendency to gain electrons.

Driver 1

Correlates with high Electronegativity.

Driver 2

Correlates with highly negative Electron Gain Enthalpy.

Increases



Exam Takeaway: Synthesizing the Divide

High-Yield Link: An element's physical location reliably predicts the acid/base nature of its oxides.

	Metal (Extreme Left)	Metalloid (Center)	Non-Metal (Extreme Right)
Chemical Reactivity	Highly reactive (Electron loss)	Intermediate	Highly reactive (Electron gain)
Oxide Nature	Basic Oxides	Amphoteric or Neutral	Acidic Oxides
Examples	Na_2O , MgO	Al_2O_3 , As_2O_3 , CO , NO	Cl_2O_7 , SO_3



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