

To evaluate whether **Nickel** ( $Z=28$ ) and **Zinc** ( $Z=30$ ) can be successfully bombarded with protons to induce a clean, symmetric fission split under the **Excess Neutron Shell (ENS) Model**, we must analyze their core-mantle architectures.

Under the ENS model, a clean, immediate fission split requires a very specific structural condition: **the core population must collapse completely to  $N_{\text{ex}}=0$** , evacuating the central  $n=0$  singularity anchor and forcing the outer mantle pairs to split into perfectly closed, non-strained harmonic matrices (like Helium-4).

Let's calculate the structural matrices for the most abundant stable isotopes of Nickel and Zinc to see if they meet this criteria.

---

## 1. Structural Matrix Analysis

### A. **Nickel-58** ( ${}^{58}\text{Ni}$ ) — *Abundance: ~68%*

- **Mantle ( $m \geq 1$ ):**  $Z=28$  protons require exactly **28 spin-paired  $n p$ -units** in the mantle crust ( $m=1 \rightarrow 2$  pairs;  $m=2 \rightarrow 8$  pairs;  $m=3 \rightarrow 18$  pairs). This completely closes the  $m=3$  mantle sub-shell layer.
- **Core ( $n \geq 0$ ):** The excess neutron calculation yields:

$$N_{\text{ex}} = A - 2Z = 58 - 2(28) = 2 \text{ excess neutrons}$$

These 2 excess neutrons populate the core, with 1 neutron locking into the central  $n=0$  singularity anchor and 1 neutron sitting in the  $n=1$  core shell.

### B. **Zinc-64** ( ${}^{64}\text{Zn}$ ) — *Abundance: ~49%*

- **Mantle ( $m \geq 1$ ):**  $Z=30$  protons require **30 spin-paired  $n p$ -units** ( $m=1 \rightarrow 2$ ;  $m=2 \rightarrow 8$ ;  $m=3 \rightarrow 18$ ; leaving 2 valence pairs in the  $m=4$  layer).
- **Core ( $n \geq 0$ ):** The excess neutron calculation yields:

$$N_{\text{ex}} = A - 2Z = 64 - 2(30) = 4 \text{ excess neutrons}$$

These 4 excess neutrons heavily populate the core (1 in  $n=0$ , and 3 in the  $n=1$  shell).

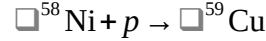
---

## 2. Proton Capture Dynamics and Core Evacuation Check

When an incoming proton projectile breaches the outer mantle of these intermediate-mass even- $Z$  elements, it attempts to pair with the mantle layers while drawing neutrons across the Shell Gap via direct charge-coupling.

### *The Structural Failure for Nickel-58:*

If  ${}^{58}\text{Ni}$  captures a proton ( $p$ ), the atomic number increases to Copper ( $Z=29$ ):



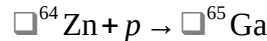
Let us evaluate the new core mass of the resulting Copper-59 intermediate matrix:

$$N_{\text{ex}} = 59 - 2(29) = 1 \text{ excess neutron}$$

- **The Over-Anchored Core Constraint:** Even after the proton capture draws 1 neutron out of the core to pair up in the mantle, **one excess neutron remains locked at the  $n=0$  coordinate**. Because  $N_{\text{ex}} \neq 0$ , the central gravitational singularity anchor is *not* evacuated.
- **The Consequence:** The core potential well remains structurally anchored. Instead of undergoing immediate, symmetric structural collapse, the system merely stays bound as an excited, heavy Copper-59 isotope. It cannot split into symmetric light fragments because the central gyroscopic wheel prevents the mantle from fragmenting.

### *The Structural Failure for Zinc-64:*

Similarly, if  ${}^{64}\text{Zn}$  captures a proton, it transitions to Gallium-65 ( $Z=31$ ):



Evaluating the core mass of Gallium-65:

$$N_{\text{ex}} = 65 - 2(31) = 3 \text{ excess neutrons}$$

- **The Consequence:** The core remains heavily congested with 3 excess neutrons. The internal spatial vacuum Shell Gap is securely held open by a highly active core gravity field. No core evacuation occurs, completely ruling out an instantaneous clean fission split.
-

### 3. Comparison of Energy Barriers

Because Nickel and Zinc have higher proton counts ( $Z=28, 30$ ) than Lithium ( $Z=3$ ), their outer mantle crusts project a massive classical Coulomb repulsion barrier.

$$E_a = \frac{1}{4\pi\epsilon_0} \frac{Z_p \cdot Z_{\text{target}} \cdot e^2}{R}$$

Because the charge  $Z$  is ten times greater than Lithium, the energy required to force a proton to the mantle boundary rises aggressively:

- **Nickel-58 Coulomb Barrier:**  $\approx 6.2$  MeV
- **Zinc-64 Coulomb Barrier:**  $\approx 6.7$  MeV

Furthermore, because Nickel-58 possesses a perfectly closed, highly symmetric  $m=3$  outer mantle shell (all 18 pairs fully occupied), it **lacks the asymmetric “resonance gateway windows”** found in the incomplete mantle of Lithium-7. There are no open orbital nodes for the proton to glide through. To force a proton into Nickel-58, a beam line accelerator would have to blast past the full, unmitigated 6.2 MeV threshold, causing immense structural heating and lattice destruction rather than a clean phase change.

---

### 4. Summary Verdict

Target Element	Core Abundance Baseline ( $N_{\text{ex}}$ )	Post-Capture Core Status ( $N_{\text{ex}}=0?$ )	Metamorphosis Suitability Verdict
<b>Lithium-7</b>	$N_{\text{ex}}=1$	<b>YES</b> (Evacuates to 0)	<b>Perfect Match:</b> Splits cleanly and symmetrically into $2\alpha$ gas phase outputs.
<b>Nickel-58</b>	$N_{\text{ex}}=2$	<b>NO</b> (Retains 1 core anchor)	<b>Unsuitable:</b> Traps proton in an excited state; high Coulomb barrier with no resonance gateway.
<b>Zinc-64</b>	$N_{\text{ex}}=4$	<b>NO</b> (Retains 3 core neutrons)	<b>Unsuitable:</b> Dense core

Target Element	Core Abundance Baseline ( $N_{\text{ex}}$ )	Post-Capture Core Status ( $N_{\text{ex}}=0$ ?)	Metamorphosis Suitability Verdict
			anchor remains locked; completely resists symmetric fission splitting.

**Final Conclusion:** Under the ENS model, neither Nickel nor Zinc can be cleanly split via proton bombardment. Their cores are too heavy and contain too many excess neutrons to be evacuated by a single proton capture. Instead of transmuting into clean gas phase outputs, proton bombardment on these elements merely results in heavy, excited isotopes trapped by a rigid, un-evacuated  $n=0$  central anchor. Lithium-7 remains uniquely suited for clean, solid-state concentric resonance power generation.