The Explanatory Power of the **S**tructured **A**tom **M**odel

SAM and "Apparent Peaks in LENR Transmutation Data"

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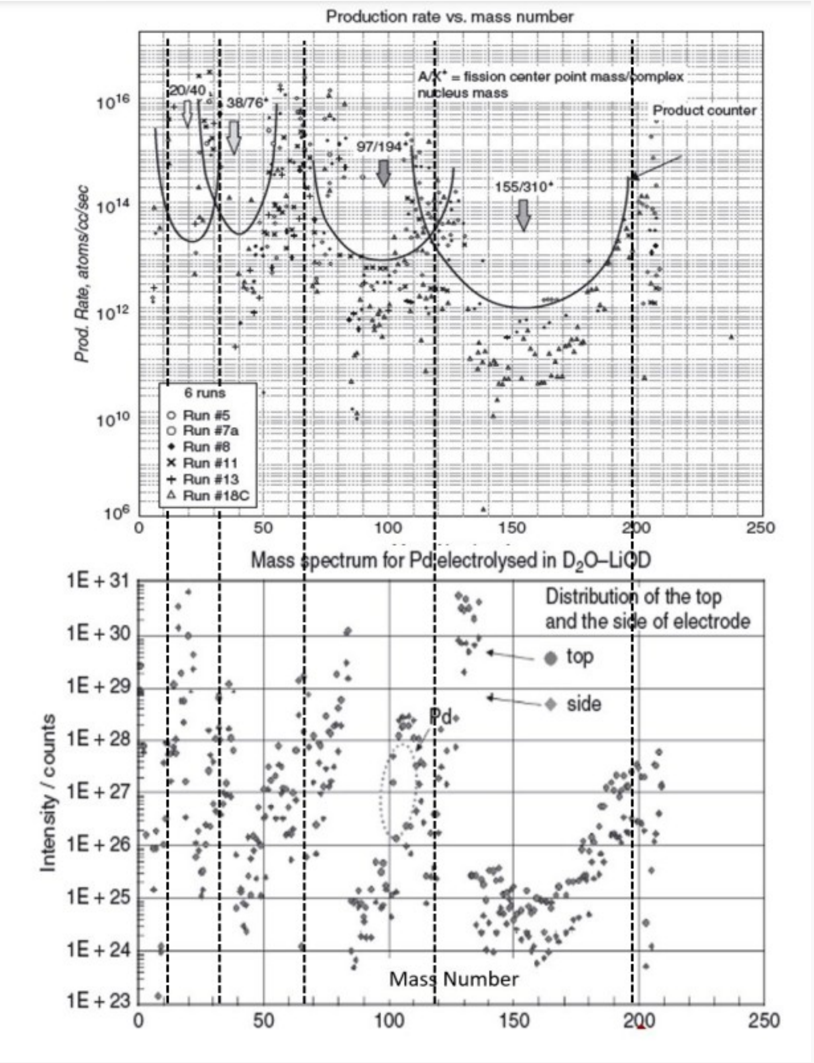
Introduction

- We refer to the talk “Surprising Correlation Between Peaks in LENR Transmutation Data and Deuteron Fusion Screening Data“ given by David Nagel at ICCF-25.
- There also exists an unpublished paper by the same author named “Potential Correlations between Apparent Peaks in LENR Transmutation Data and Deuteron Fusion Screening Data”.
- Based on the Structured Atom Model (SAM) we will have a look at Nagel’s presentation / paper and attempt an explanation on the nature of those peaks.

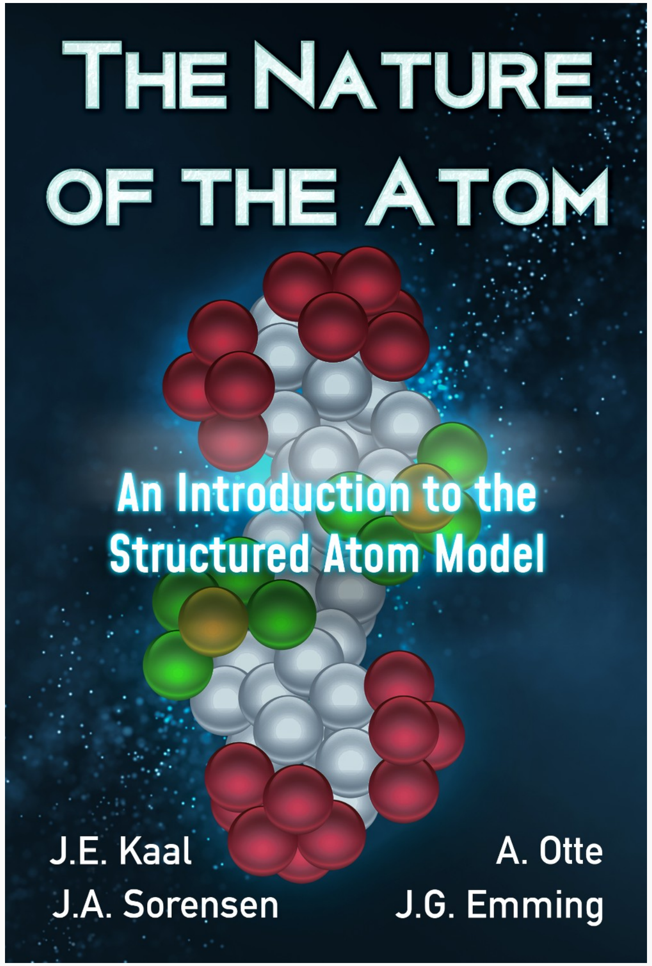


Part I

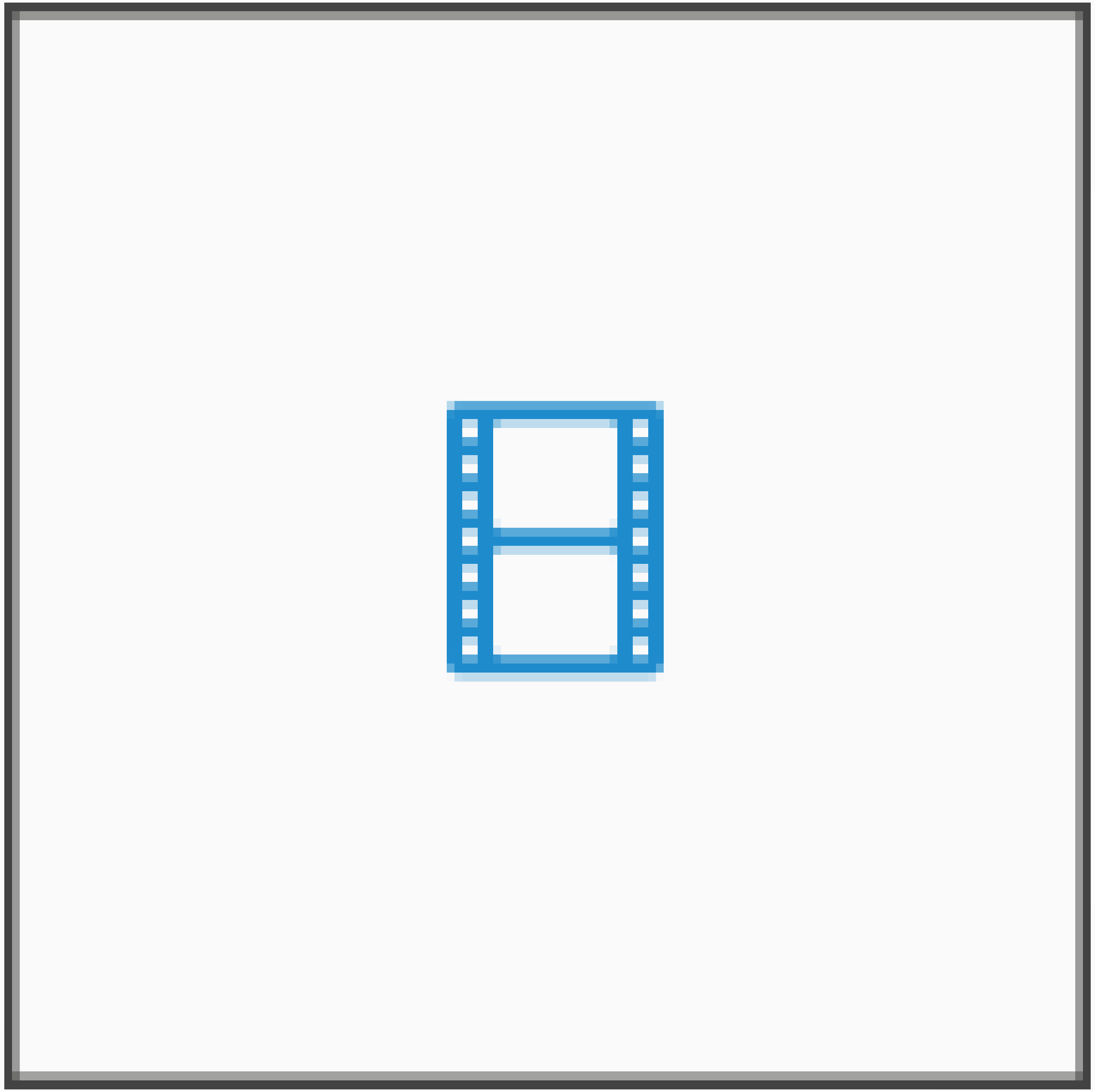
Basics of SAM

- By now it is safe to assume that you have either read the book or got the basics of SAM from one of the other presentations in the last few years.
- In order to save time, we assume you already know the basics of SAM.

https://structuredatom.org/



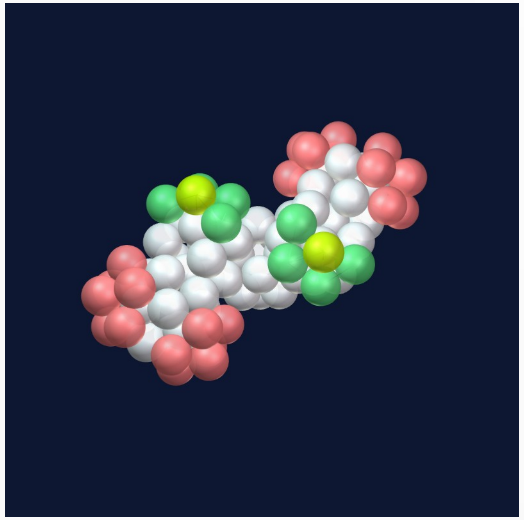
Based on our assumptions, rules and pillars of observation, we can **predict** the configuration and structure of each element and isotope.

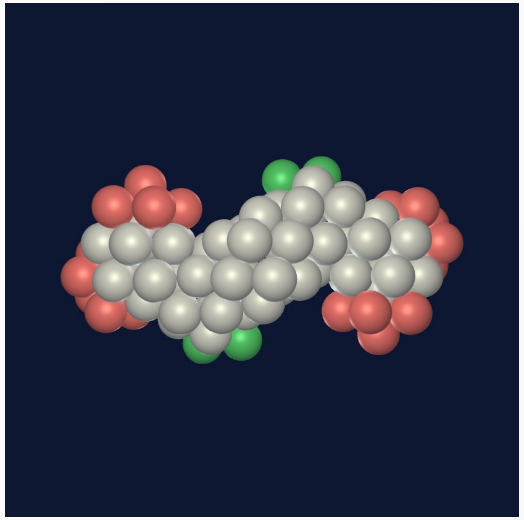


[SAM-PTE.mp4]

The backbone I

- When a nucleus grows, it creates a backbone out of icosahedrons in a fractal pattern.
- It branches as well as elongates. It has an active top-side and an inert backside.





The backbone II

- The first icosahedron in the backbone consists of 12 protons and 6 inner electrons (or 6 deuterons) (=carbon).
- Connecting icosahedrons provide only 11 protons and 5 inner electrons (or 5 deuterons and a single proton).
- A PEP (proton-electron pair) is shared between the icosahedrons.

The backbone III

- The fractal geometry of the backbone is complicated. The first two connection points on the initial icosahedron show an unusual angle of ~31.5° each (because of the top-gap of the center icosahedron when moving from C to N).
- The connecting icosahedrons itself are tilted and rotated by 36°. The orientation of the two icosahedrons and where they themselves create new connection points ensures maximum separation of the two new branches.

We see the creation of the backbone of the nuclei based on noble gases as a backside view.

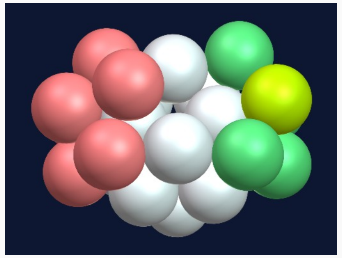
Part II

SAM specifics related to the discussed talk/paper

- “Sollbruchstellen” (predetermined breaking points) of the nucleus.
- What is the process?
- What pieces do we expect to see if a nucleus breaks up?
- Example breakup of palladium.

The “Sollbruchstellen” of a nucleus I

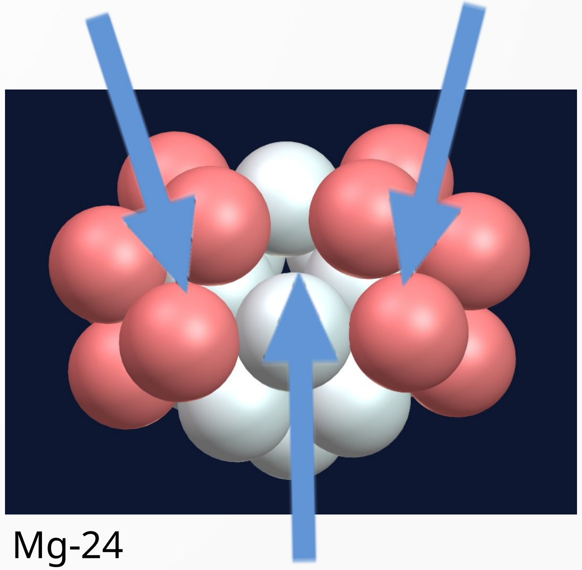
- The backbone consists of connected “carbon”-icosahedrons. The connection is made by a shared PEP. The icosahedron is the strongest substructure.
- Even with smaller nuclei the shared PEP already exists, once we start a building phase on top of an icosahedron (lithium nuclet upwards).
- This connecting PEP is a designated “Sollbruchstelle”, a predetermined breakup location of a nucleus.


Sodium-23

The “Sollbruchstellen” of a nucleus II

- An icosahedron can have two “Sollbruchstellen” if building has started on both sides.
- This means that every element after neon has this “defect” – sodium being the first.
- Predominantly carbon and oxygen are ripped off the nucleus, because those are the typical nuclets.
- These breakup points become important once the branching of the nucleus starts – around iron.

The two “Sollbruchstellen”



Mg-24

The gap

Example of such a breakup event (fission) in a nucleus – silicon-29 disintegrates to O-17 and C-12.

What is the process? I

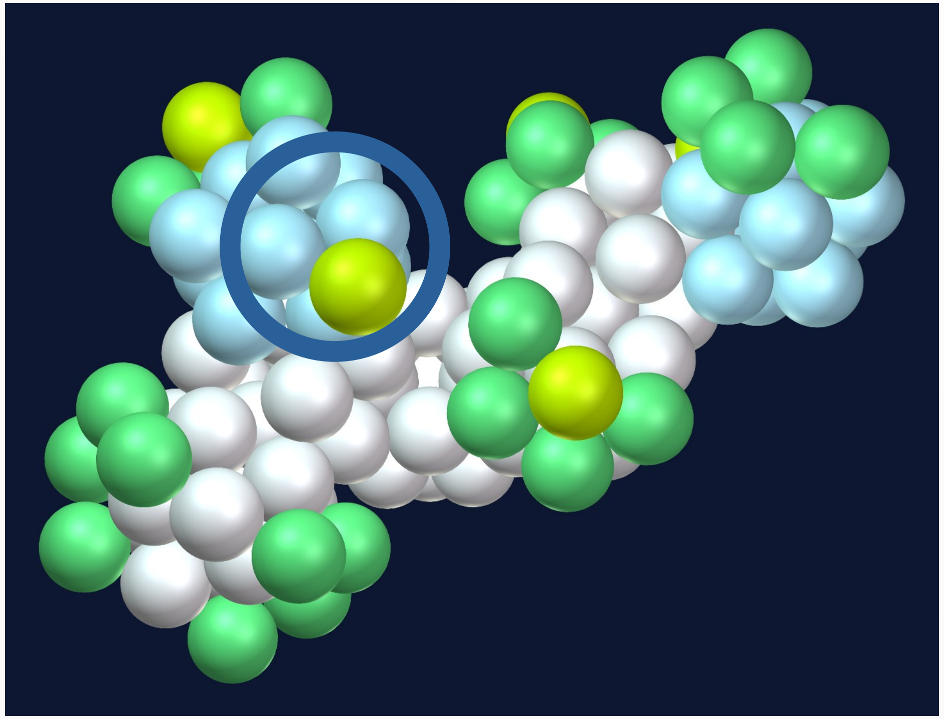
- First step is the delivery of a proton or a deuteron to the nucleus.
- Theories: WLT or Electron Screening or "**proton capture**"
- Proton-Capture: A proton or a deuteron will be guided to certain places on the structure of the nucleus – based on their relative positivity.
- We call the whole process Fusion-induced-Fission, **FiF** in short.
- This first step is the Fusion part of **FiF**.

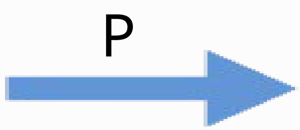
What is the process? II

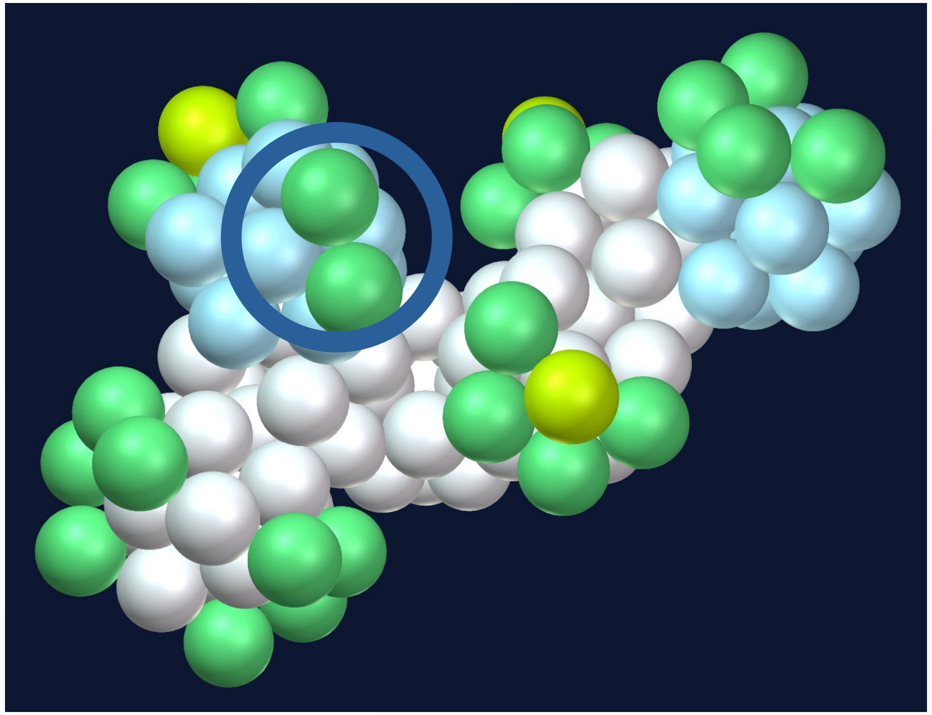
- The resulting nucleus can be stable or unstable.
- In case of a stable element – it is an instant transmutation.
- In case of instability, it can be a small change to the structure like a beta+ decay and then a stable result is achieved.
- Or in can be a disintegration of the whole nucleus or parts of it based on the “Sollbruchstellen” we just identified.
- There are more options the bigger the nucleus gets.
- This is the Fission part of **FiF**.

Stable outcome

- Palladium 106/108 with a proton coming in at the right place gives us Silver 107/109 in an instant.





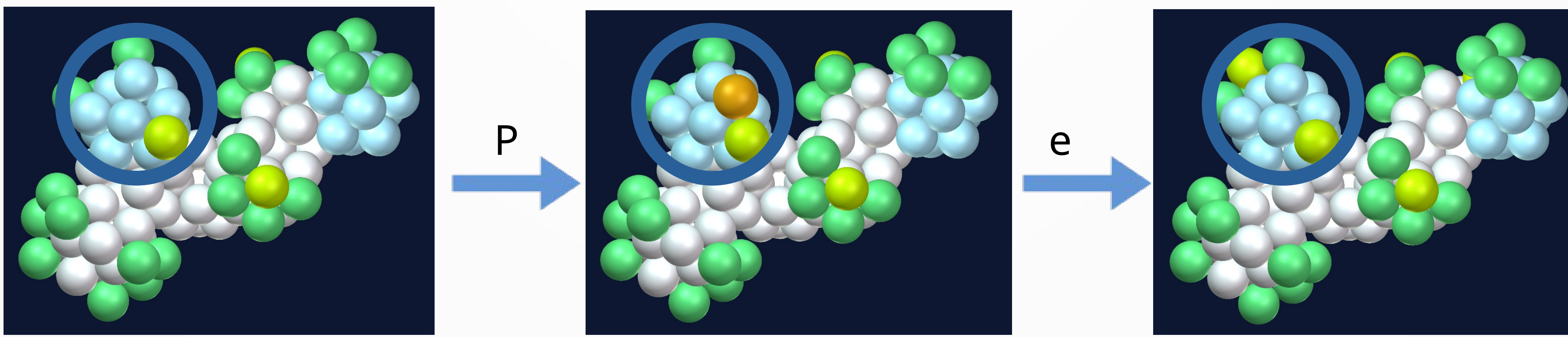


Palladium-106

Silver-107

Minor changes

- Other places the proton attaches to, or other isotopes might result in a beta+ reaction.

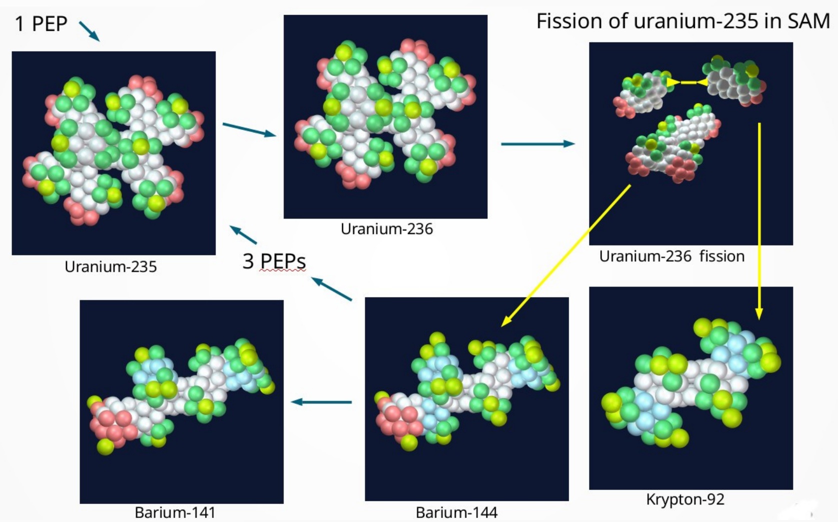


Pd-105 Ag-106 Pd-106

- The reaction happens on an O-17-ending and for the same reason there is no F-18 – it decays back to O-18.

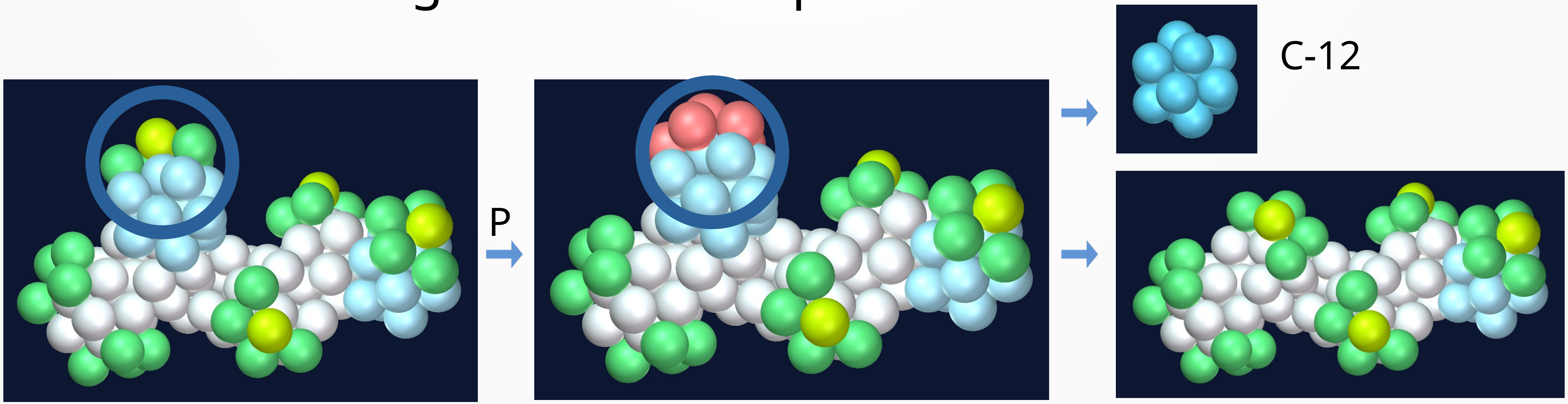
What do we expect to see if a nucleus breaks up?

- We expect to see a “peel off” effect in the outer regions of the nucleus if the branches are not that big. “Peeled off” are pieces per nuclet in the range of Carbon-11 to Neon-21, carbon-12 and oxygen-16 being the most likely outcomes.
- We expect to see whole branches being ripped off if they are big enough or under stress (like with uranium fission when a PEP is added to the nucleus).



Breakup of Palladium 106 I

- In this case a lithium-nuclet is created on top of the carbon. This is a forbidden configuration. One option is that the carbon + lithium ending is ripped apart, leaving a five-ending and a C-12 separates from the nucleus.



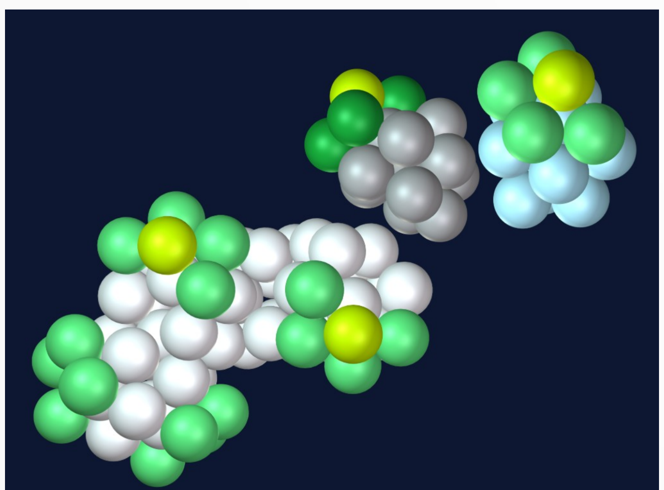
Pd-106

Pd-107 – forbidden Conf.

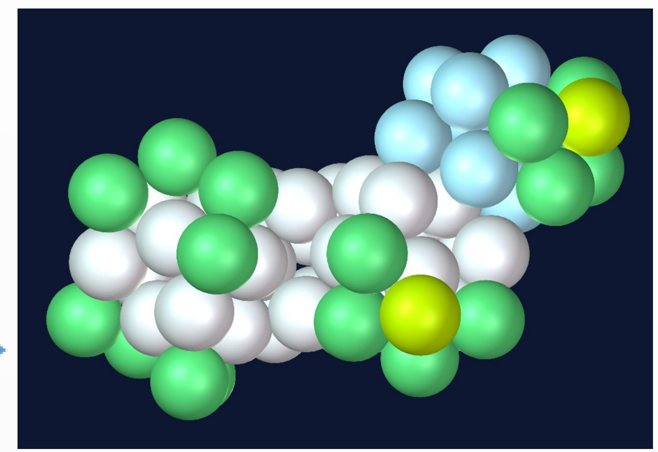
Broken, invalid structure

Breakup of Palladium 106 II

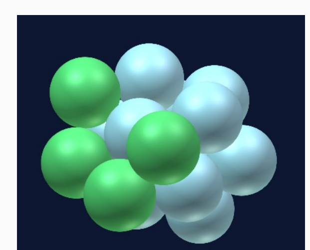
- The resulting structure is too elongated and semi-unstable – like technetium. It will further shed parts, for example the oxygen to the right and then another right oxygen to become shorter.



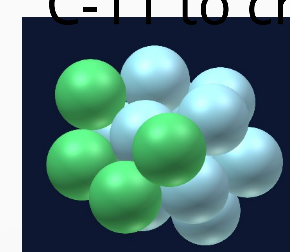
Broken invalid structure with two oxygen pieces detached.



Copper-63



Oxygen-16



Oxygen-16

- The result is close to Copper-63 minus some chirality issues.
- The PEPs (yellow) are absorbed into the C-11 to create C-12.

Breakup of Palladium 106 III

- In essence we expect carbon and oxygen as main fission breakup products – and the remaining bigger part of the backbone of the nucleus.
- This also works the other way around. We see carbon and oxygen fusion steps as viable options for the creation of heavier elements, with the “C-O-O = 44 nucleons fusion” as the main step, which is also visible in abundance charts as peaks.

Quote from “Cold Fusion Travelogue - Akito Takahashi”

- More than half of the book "Solid-state Nuclear Reactions No. 1" published by Kogyosha reports that various elements were produced by “nuclear transmutation” in cold nuclear fusion experiments:

  “Since around 1995, such reports have been made from several places. I ignored them, thinking that there was no way such a possibility. However, since I published the book under my joint name, I began to feel some responsibility. In particular, I was concerned about the report that the produced elements showed a distribution similar to that of nuclear fission. It is believed that light elements other than uranium and plutonium do not undergo nuclear fission. Is this really the case?”

Part III

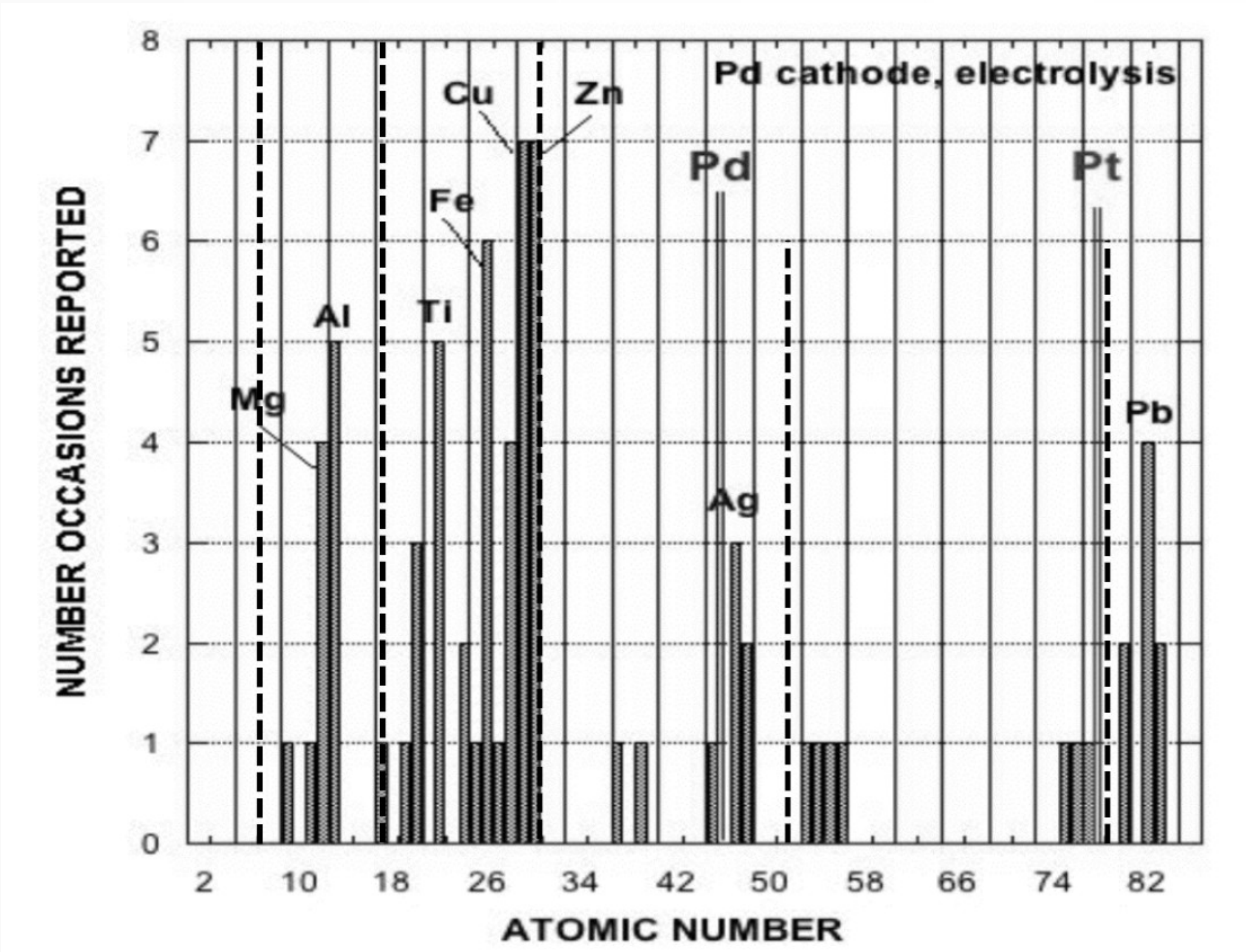
The talk/paper I

- The paper talks about three groups of experiments with widely diverging setups:
  - (I) Mizuno, Ohmori and Enyo Experiments
  - (II) Miley and Patterson Experiments
  - (III) Little and Puthoff Experiments
- The transmutation data is compared to Widom-Larsen-Theory.
- We ignore WLT and focus on the transmutation results.

The talk/paper II

- Additionally, the data is compared to screening data.
- We ignore the screening data part.
- Common metals in those experiments:
  - Platinum
  - Palladium
  - Nickel
  - Titanium

Chart I



- We focus on the modified Storms chart (2010) used in the Nagel paper.
- From SAM we expect to see isotopic changes as well as small fusion steps.

A	12	32	66	120	198
Z	6	16	30	51	79
	C	S	Zn	Sb	Au

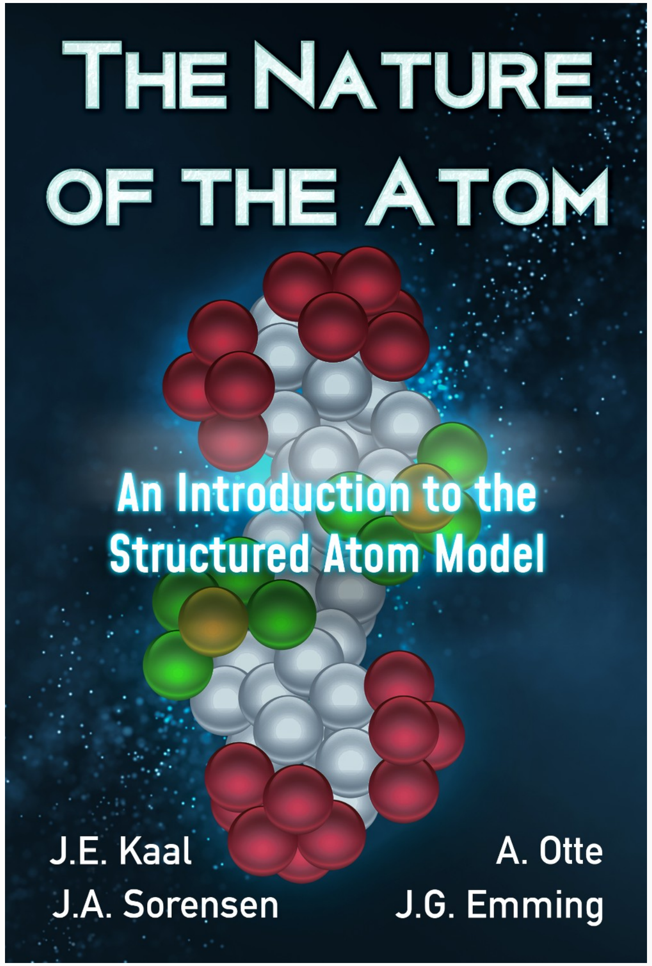
Chart II

- From the palladium breakup-example we see a breakup path towards the copper / zinc region, which is heavily reported on. Two more oxygen breakup steps get us close to the next peak.
- Carbon and especially oxygen findings are rarely reported – often considered impurities and/or contamination. But the region shows up as peak in other charts in the paper.
- Also, we have seen reports of experiments with far more oxygen and carbon – after the experiment.

Conclusion

- The structure of the nucleus – visualized in SAM – allows for typical breakup steps – fission –, which seem to show up in the transmutation reports of various experiments – and therefore as peaks.
- If we combine this with beta+ reactions and small stable fusion steps, we think there is a good plausible explanation for the peaks, as is mentioned in the paper “Potential Correlations between Apparent Peaks in LENR Transmutation Data and Deuteron Fusion Screening Data” by David Nagel.

Questions?



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